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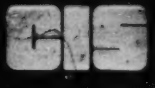

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ENERGY SECURITY

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

ON THE

MAY 6, 1987, REPORT OF THE PRESIDENT OF THE UNITED STATES CONCERNING ENERGY SECURITY ISSUES REQUIRED BY THE OMNIBUS BUDGET RECONCILIATION ACT OF 1986; AND TO EXAMINE THE "ENERGY SECURITY" REPORT TO THE PRESIDENT AND THE CONGRESS PREPARED BY THE DEPARTMENT OF ENERGY

MAY 20, 1987

Printed for the use of the
Committee on Energy and Natural Resources

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ENERGY SECURITY

WEDNESDAY, MAY 20, 1987

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 2 p.m., in room SD-366, Dirksen Senate Office Building, Hon. J. Bennett Johnston, presiding.

The CHAIRMAN. The hearing will come to order.

OPENING STATEMENT OF HON. J. BENNETT JOHNSTON, A U.S. SENATOR FROM THE STATE OF LOUISIANA

The CHAIRMAN. The Iraqi attack on the U.S.S. *Stark* put in very stark relief the difficult problem this country faces on energy. We are highly dependent upon the Middle East. About 40 percent of our supplies are dependent upon imports, and an increasing amount of that on OPEC. We are headed toward, according to the administration, 50 percent dependency. That is worse than it was in 1973.

And indeed, in 1973 we had already discovered Prudhoe Bay, which was yet to come on line with its 2 million barrels a day. The difference is today Prudhoe Bay has already been discovered, and that production is going down. So, our situation is infinitely worse than the first oil shock that beset us in 1973. Indeed, we were a healthy petroleum industry in 1973 with a huge—in fact, the country's biggest—discovery yet to come on line.

In the Reconciliation Act of 1986, we required the President to conduct a study of domestic oil production and petroleum refining capacity and the effects of imports thereon. Section 3102(d) of that act required the President to report to Congress—and I quote—"his views concerning the levels at which imports of crude oil and refined petroleum products become a threat to national security and advise the Congress concerning his views of the legislative or administrative action, or both, that will be required to prevent imports of crude oil and refined petroleum product from exceeding those levels that threaten our national security."

The President's report was received on May 6. I am frank to say that I am extremely disappointed by the lack of substance in the President's report. The problem was very well set out in that report. The problem is very clear. The Nation faces a very difficult crisis. If we don't have an energy crisis now it is only temporary and it will descend upon us next time in a much more difficult way, in my view, than it did the last time. The U.S.S. *Stark* incident is just the precursor of what we have to face.

Unfortunately the administration has proposed a series of nostrums and in some instances some good things, many of which I support but which are no solution to this crisis. The fact that we need nuclear licensing reform, I support very strongly. There is no solution here. If we had those laws in place, there would be no new nuclear plants built because they are not ready to build them.

It would be nice to drill, according to the administration on the Alaskan National Wildlife Refuge, and we have to deal with that question. But if we authorize that, and it came on line, that oil would not be available for 10 to 15 years. Drilling off the California coast, which I have supported for a long time, is a long way off, and it is certainly not going to solve the problem.

Repeal of the windfall profits tax ought to be done. But it is not being collected now, and it is not a major impediment to domestic production. The one thing that can save the domestic oil industry, which is being dismantled bit by bit, piece by piece, with a rapid implosion, is an oil import fee. And the administration has opposed that from day one. Indeed, the makers of the study were implicitly told, if not explicitly, to define the problem, if you will, but don't recommend an oil import fee no matter how strongly you may find that that is appropriate. And they followed that injunction very well. So, the report is a series of sidesteps as to how to sidestep what the obvious solution is.

I would hope that at some point the administration will come around to the oil import fee in time to save the industry. I can tell you that Louisiana is in the heart of oil industry, and it is not just a question of having the highest unemployment rate in the country. Those are personal tragedies multiplied thousands of times over which are very difficult. We do not ask on the basis of thousands of personal economic tragedies that we have an oil import fee. We ask it on the basis and in the name of national and economic security. I can tell you this. It is pennies now or it is dollars later. It is millions of dollars now in terms of oil import fee, or it is billions for defense and for OPEC oil later. I wish we would make it sooner than later, and try to solve the problem rather than deal with its effects when it hits us.

[The prepared statements of Senator Johnston and Senator McClure follow:]

STATEMENT BY SENATOR J. BENNETT JOHNSTON
OVERSIGHT HEARING ON ENERGY SECURITY
MAY 20, 1987

THE IRAQI ATTACK ON THE U.S.S. STARK HAS ONCE AGAIN RIVETED THIS NATION'S ATTENTION ON THE MIDDLE EAST. WE HAVE BEEN REMINDED THAT IT IS ONE OF THE MOST UNSTABLE REGIONS IN THE WORLD.

OUR ATTENTION HAS BEEN FOCUSED ON THE FATE OF THE CREW ABOARD THE STARK, AND ON UNDERSTANDING WHAT LED TO THE ATTACK.

THIS WEEK'S TRAGEDY SHOULD SERVE AS A SOBER REMINDER THAT THE UNITED STATES HAS VITAL NATIONAL SECURITY INTERESTS, AND ENERGY SECURITY INTERESTS, IN THE MIDDLE EAST.

THIS HEARING WAS CALLED TO REVIEW OUR ENERGY SECURITY SITUATION. AS EVERYONE IN THIS ROOM IS AWARE, THE UNITED STATES AND THE OTHER NATIONS IN THE FREE WORLD ARE ALREADY HIGHLY DEPENDENT UPON PERSIAN GULF NATIONS FOR VITAL OIL SUPPLIES. INDEED, IN THE FACE OF RISING DEMAND FOR OIL AND FALLING DOMESTIC PRODUCTON WE ARE BECOMING EVER MORE DEPENDENT UPON THE PERSIAN GULF FOR OUR OIL SUPPLIES.

LAST OCTOBER CONGRESS ENACTED THE OMNIBUS BUDGET RECONCILIATION ACT OF 1986. SECTION 3102(A) OF THAT ACT REQUIRED THE SECRETARY OF ENERGY TO:

> "..CONDUCT A STUDY OF DOMESTIC OIL PRODUCTION AND PETROLEUM REFINING CAPACITY AND THE EFFECTS OF IMPORTS THEREON..."

SECTION 3102(D) OF THAT ACT REQUIRED THE PRESIDENT TO REPORT TO THE CONGRESS:

"...HIS VIEWS CONCERNING THE LEVELS AT WHICH IMPORTS OF CRUDE OIL AND REFINED PETROLEUM PRODUCTS BECOME A THREAT TO THE NATIONAL SECURITY AND ADVISE THE CONGRESS CONCERNING HIS VIEWS OF THE LEGISLATIVE OR ADMINISTRATIVE ACTION, OR BOTH, THAT WILL BE REQUIRED TO PREVENT IMPORTS OF CRUDE OIL AND REFINED PETROLEUM PRODUCTS FROM EXCEEDING THOSE IMPORT LEVELS THAT THREATEN OUR NATIONAL SECURITY."

THE PRESIDENT'S REPORT WAS RECEIVED MAY 6. I WILL BE FRANK TO ADMIT THAT I AM EXTREMELY DISAPPOINTED BY THE LACK OF SUBSTANCE IN THE PRESIDENT'S REPORT. PERHAPS HE AND HIS AIDES DID NOT FEEL IT WAS NECESSARY TO PAY ATTENTION TO THE STATUTORY REQUIREMENTS FOR HIS REPORT. HE SIMPLY DID NOT COMPLY WITH THE LAW'S REQUIREMENT TO IDENTIFY THE LEVEL OF IMPORTS THAT CONSTITUTES A THREAT TO THE NATIONAL SECURITY; NOR DID HE PRESCRIBE ANY EFFECTIVE SOLUTION.

OUR WITNESS TODAY IS THE HONORABLE WILLIAM F. MARTIN, DEPUTY SECRETARY OF ENERGY. SECRETARY MARTIN WAS RESPONSIBLE FOR COORDINATING THE DOE ENERGY SECURITY REPORT. WE ARE PLEASED TO HAVE HIM WITH US TODAY. I HOPE HE WILL PROVIDE SOME INSIGHT ABOUT THE DOE REPORT AND THE PRESIDENT'S REPORT.

STATEMENT OF
SENATOR JAMES A. McCLURE (R-ID)
RANKING MINORITY MEMBER

AT THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES
MAY 20, 1987 HEARING ON

THE DEPARTMENT OF ENERGY'S ENERGY SECURITY REPORT
AND
THE PRESIDENT'S VIEWS AND RECOMMENDATIONS TO THE CONGRESS ON
THE ENERGY AND NATIONAL SECURITY CONCERNS RELATED TO OIL IMPORT LEVELS

I want to welcome you here today, Deputy Secretary Martin, to review with the Committee the Department of Energy's Energy Security report, and the President's recommendations to Congress on actions needed to reduce the threat to the national security from imported oil. Unfortunately, I am disappointed with both; they are simply inadequate. Moreover, neither fully satisfy the requirements of section 3102 of the fiscal year 1987 Budget Reconciliation Act.

The Department's report and the President's recommendations acknowledge that our growing dependence on foreign oil is a threat to our national security. I agree with that. Where I disagree is with the assessment of the severity of the threat, and the actions needed to counter the threat.

The Department's report significantly understates the threat to our national security, and the Administration's recommendations are inadequate, even to meet that understated threat. Moreover, the report fails to consider a number of important energy initiatives which could signficantly contribute to our energy security, and this is reflected in the President's recommendations to Congress. The

Department's report and the President's recommendations, therefore, can only be considered as a starting point for deliberations and decisions on developing a comprehensive national energy security policy.

Some claim that last year's dramatic fall in oil prices is proof positive that OPEC is "dead"; that it is no longer capable of manipulating supply and price and, therefore, that we no longer need to be concerned. I think otherwise.

Last year's fall in prices wasn't the result of free market forces. It was instead intentionally engineered to drive prices down in order to punish errant OPEC members and to shut-in non-OPEC oil production. And it worked. OPEC now has a production quota which is obeyed; marginal production is being shut-in in the United States and elsewhere; and exploration and development has fallen dramatically.

Although world oil prices are now substantially higher than they were last summer, they are still intentionally being manipulated--being set high enough for OPEC to make a profit, but low enough to discourage exploration for replacement reserves and the development of alternative fuels. Some may claim otherwise, but to me it is clear that OPEC still controls the market, driving prices down when it suits their interests, and pushing them up when it suits their interests.

Without action, our growing dependence will get worse. That is the conclusion of the Department's report. It forecasts, under a

business-as-usual assumption, that the United States could become fifty percent foreign oil dependent by 1990, and sixty-two percent dependent by 1995. To me that is a sure prescription for a severe energy crisis, one far greater than was caused by the 1973 Arab oil embargo when we were only thirty-six percent dependent.

The ongoing war between Iraq and Iran continues to threaten these supplies, as well as risks direct U.S. military involvement in the region. More than 200 merchant ships have been attacked in the Persian Gulf, and just recently the United States agreed to use U.S. Navy warships to protect Kuwaiti oil tankers from Iranian attack. The recent Iraqi attack on a U.S. warship in the Persian Gulf illustrates some of the risk of our dependence on that region's oil supplies.

Given the volatility in the region, it is almost a certainty that the Middle East's supply of oil will be disrupted for one reason or another at some point in the future. Whether it happens today, tomorrow, next year, or in 10 years is unknown--but that it will happen is entirely predictable.

The question now facing us is what steps should we take to provide our economy a secure and reasonably priced supply of energy. One measure has been taken: we now have a sizable Strategic Petroleum Reserve. The SPR serves as our first and only means of reducing our vulnerability to any potential oil supply interruption. This is recognized by the Administration. We are filling the SPR at the rate of 75,000 barrels per day and the President has informed the Congress

that he is prepared to support an increase in the fill rate to 100,000 barrels per day.

This position was communicated to our International Energy Agency partners at the May 11 ministerial meeting. At that meeting a joint commitment was made by IEA Members to increase government-controlled stocks, with the ultimate objective of at least 90 days of truly accessible stocks. Our commitment to the SPR has spurred our allies to undertake similar commitments to maintaining sufficient stocks to make meaningful contributions to early, coordinate stockdraws.

At that same IEA meeting there was also discussion of the need to diversify energy sources; of the need to recognize the important contribution which nuclear energy makes to our collective energy security; of the need to remove remaining barriers to free energy trade and avoid creation of new ones; of the need to continue to enhance energy efficiency; and of the need to continue to enhance international collaboration in energy research and development.

What is now needed is a similar Administration commitment to the Congress to formulate a long-term energy security strategy for the United States.

Some very modest legislative recommendations were made by the President. A number of familiar proposals have been reiterated: repeal of the windfall profit tax on oil producers; comprehensive natural gas reform, including wellhead price decontrol; approval of

the Department of the Interior's five year offshore oil and gas leasing plan; permitting environmentally sound energy exploration and development of the Arctic National Wildlife Refuge; ensuring the future viability of nuclear power through nuclear licensing reform; and progress in development of a nuclear waste repository.

But the Department's report and the President's recommendations ignore a number of potentially very significant energy initiatives. For example, more comprehensive tax incentives could be used to spur domestic energy production and conservation; reduced regulatory requirements could help in all areas of energy production; standardization of civilian nuclear reactor designs would be beneficial; and enhanced research and development on all energy sources would also help.

Part of the problem in developing a long-term energy security policy has been the attitude of the Administration, which seems to be that the free market will automatically take care of any problem. I don't know of anyone outside of the Administration who would agree with that. Unfortunately, both the Department's report and the President's recommendations to Congress indicate that there has been scant change in that attitude.

Another part of the problem has been the unwillingness of some advocacy groups to allow needed energy development to proceed even when it can be accomplished with appropriate environmental safeguards. For example, there continues to be strong opposition to drilling for

new oil supplies in Alaska and on our Outer Continental Shelf even though it can be done consistent with protection of environmental values. But this problem is not limited just to oil and gas exploration.

In my opinion, we still have time to develop appropriate policies and to take needed actions. We still have time to begin purchasing energy "insurance" before the next energy crises. But we must begin if we are to be ready in time.

The CHAIRMAN. Senator Hatfield, do you have any opening comments?

Senator HATFIELD. No, Mr. Chairman.

The CHAIRMAN. Senator Nickles, did you have any opening comments?

STATEMENT OF HON. DON NICKLES, A U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator NICKLES. Mr. Chairman, just a quick comment. One, I am glad that you are having this hearing. I look forward to seeing what Secretary Martin has to say.

I might just add an editorial comment that I am disappointed in the White House's overall energy outline. I think there was a great deal of effort put into the study and I might bring this up later to the Secretary. I felt like the study underestimated the gravity of the problem that we have domestically in the oil and gas industry and also greatly underestimated the amount of imports that we will be using in this country and our vulnerability to that.

And then as a followup, I think the actions signed off on by the administration left a lot to be desired. It really almost appears as if the Secretary has not been successful in convincing other people in the administration that there is a very serious problem on an increasing dependency on unreliable sources. And I think that is unfortunate not just because I happen to be from an energy state, but I am afraid that the Senator from Louisiana and the Senator from Oregon and this Senator is going to be here when once again this country is facing a very, very serious energy shortage. And it may be caused by problems coming about in the Middle East. It may be caused by a number of things, but we are becoming very, very dependent.

And I am afraid that although I would agree with most everything that they have outlined, deregulation of natural gas, increase going to SPR, and a few other incidental things, they really don't do near enough to help reduce the increasing dependency that we find on unreliable and unstable sources.

The CHAIRMAN. Thank you very much, Senator Nickles.

Secretary Martin, I know you had to put this report together, and you did such a fine job in assessing the problem. And I know you know better than your conclusions, but you had to do those things. And so, we give you forgiveness in advance for having to come to those conclusions.

I think we know generally—in fact, I think we know specifically—what you have proposed, but perhaps you would like to discuss it. You might discuss that report with particular emphasis on the oil import fee because that is the principal question before the Congress. Some people will be for and against deregulation of natural gas, or be for or against repeal of the windfall profits tax or drilling off the California coast, et cetera. I doubt if we will take that up in the committee. But really the central issue is the oil import fee.

Senator Bingaman, did you have any opening comments?

Senator BINGAMAN. I am here to hear the testimony, Mr. Chairman. Then I would have a question or two. I do have a statement for the record.

[The prepared statement of Senator Bingaman follows:]

Statement of Senator Jeff Bingaman
Committee on Energy and Natural Resources
Energy Security Report
May 20, 1987

I thank the Chairman for holding this hearing to review the President's recent report to Congress concerning energy security issues and to examine the Energy Security report released by the Secretary of Energy this spring.

I am concerned that both reports are based on inaccurate analysis and present no concrete solutions. The Energy Security Report asserts that the weakened condition of the U.S. oil industry, our shrinking domestic production and high levels of imported oil constitute no significant problem for U.S. national security.

I am afraid the facts do not justify this conclusion and would not be supported by the citizens of my state.

I recently chaired oversight hearings of the Energy and Natural Resources Committee in New Mexico which attracted over 2,000 of the State's citizens. These hearing brought testimony from major and independent producers, local and State government officials, industry associations, the

Chamber of Commerce, business owners and local citizens, all of whom made clear that we are in danger of losing one of our most important and strategic domestic industries. These citizens expect the administration and Congress to act responsibly and quickly to revive a level of drilling and exploration activity that can meet the domestic needs of our Nation and protect our energy security.

It is clear that the American people cannot depend on this administration to do what needs to be done to protect our energy security interests. We have waited months for the comprehensive energy security study that we review today. I regret this highly publicized document is, at best, only an acknowledgment of a problem we all know exists. What we need now is a strategy for dealing with it. The report offers no solutions and no plan for action.

The President was required to report his views concerning the levels at which imports of crude oil and refined petroleum products become a threat to native security and advise the Congress concerning the action needed to protect that security. His report does little to meet these statutory requirements.

I introduced S. 751, the Energy Preservation Act, to address these issues and to set out a strategy to meet our energy security needs. I look forward to the Committee's

consideration of this legislation and to hearing from our witnesses.

The CHAIRMAN. With that lead-in, Secretary Martin, welcome to the committee. Please proceed.

STATEMENT OF WILLIAM F. MARTIN, DEPUTY SECRETARY, DEPARTMENT OF ENERGY, ACCOMPANIED BY SCOTT L. CAMPBELL, DIRECTOR, OFFICE OF POLICY, PLANNING AND ANALYSIS

Mr. MARTIN. Thank you, Mr. Chairman. I would like to introduce Scott Campbell who had a lot to do with the Energy Security report. He is head of policy in the DOE.

Mr. Chairman, I think the administration and the Congress are concerned that lower oil prices are going to bring about a national security problem. As you know, we have labored for about 8 months to put together the energy security report. We wanted to have a report that looked not only just at oil, but looked at all energy sources, and which did not look at just the United States, but looked internationally because if the definition of the problem is reliance on the Persian Gulf, we had to see what other energy sources could contribute and what the responsibilities would be of our allies and friends around the world.

Senator HATFIELD. Mr. Chairman, I wonder if he could pull the microphone a little closer.

Mr. MARTIN. One of the things the report points out is that over the last decade we have made a lot of progress in diversifying away from the Persian Gulf. Worldwide coal use has increased by 35 percent, nuclear power sixfold. Non-OPEC oil sources are up 25 percent. And we do not use any more energy today than we did in 1973, and we use less oil. That is not only true for the United States, but for the OECD countries as a whole.

So, the bottom line is that OPEC's share of the world oil market has been reduced from 65 percent to 40 percent. So, a lot of the hard work of the Committee and the private sector in diversifying away from oil had been paying off until we came to 1986.

And 1986, while it brought good news to consumers of oil, brought very bad news to producers of energy not only oil, but coal and nuclear power. We have seen questions regarding nuclear power as a result of Chernobyl this year. We know that coal, with the issue of acid rain before us, is a contentious matter. Furthermore, due to the devastating effect on the oil industry we have seen 150,000 jobs lost, a rig count below World War II levels, production drop of 800,000 barrels a day. And I think it was against this setting that the President asked Secretary Herrington last September to say do low oil prices present a national security problem. Are we living in a fool's paradise basically?

Well, the projections are very sobering. If you will just allow me to put up a couple of charts, I think it will underscore your concern about the future.

The first are projections of oil production, consumption and imports. Let me say from the beginning, we did not hype these numbers. We assumed a low demand and we made a relatively optimistic forecast of U.S. oil production. And yet, we show imports into this country surpassing the 50-percent level as early as 1992, reaching maybe 60 percent of our oil consumption by 1995 if oil prices

remain low. And that means an absolute level of 8 million to 10 million barrels a day of imports. I think you would agree that is a troubling picture. I think it is comparable to what other forecasts have said about our energy situation.

At the same time, we did not stop in the United States. We had to look at what was happening in Europe and Japan too. And what we found there was cause for concern. We found imports in these nations going up. And I might add——

The CHAIRMAN. May I interrupt you there?

Mr. MARTIN. Yes.

The CHAIRMAN. I am advised that in the first 2 months of this year we have already reached your production levels for 1990. Is that correct?

Mr. MARTIN. I don't believe so. We would be glad to answer that in questions.

The CHAIRMAN. Just to clear up that one thing, the energy security report, page 22, shows U.S. crude oil and natural gas liquids production was 11.2 million barrels per day in 1985. Your report projects U.S. production of crude and liquids will be 10.1 million barrels a day in 1990 in the high-priced case. In fact, according to the Monthly Energy Review, U.S. production for January and February 1987, averaged 10.1 million barrels a day and 10.0 million barrels a day. We have already reached the target 3 years early. Is that not correct? And would you care to comment?

Mr. MARTIN. I have EIA here, and while they are looking up the number, why don't I continue and come back to it so we can make sure that we are accurate in answering your question.

The CHAIRMAN. Sure.

Mr. MARTIN. Let me say that the situation we saw internationally was similar: imports are on the rise in Europe, Japan and the Third World, and other high-cost producers, such as the North Sea, Mexico and Canada, also are facing troubles maintaining active exploration programs. The bottom line of all this is that OPEC can, indeed, return to a situation of dominance in oil markets. If oil prices remain low their share of the oil market can increase possibly as high as 60 percent, which is comparable to where they were in the 1970's.

I would like to have one caveat here. We know that yesterday's spot price was at $19.98 in Cushing. That price is comparable to our trajectory in the higher price case.

Senator NICKLES. Would the Secretary yield for just a half a second?

I think it is awfully important when we talk about and read in the papers that prices are $19.90 or so on——

Mr. MARTIN. Spot.

Senator NICKLES [continuing]. When the prices paid to domestic producers, at least in my state in north Texas, are $17.50 or $18. You may have a few cases where you have spot contracts which exceed that, but it is a real misrepresentation to be reading that oil prices are $20 because in the producing areas posted prices, what producers are paid, is $17.50.

Mr. MARTIN. That is right. That is contracted oil. And as I have pointed out, Senator, what I was talking about was the Cushing, Oklahoma spot price. It is always important to remember that

posted prices are usually a dollar or two below what the spot contracts presently have.

Senator NICKLES. Well, the future prices, which are most often quoted, are not posted. That is the point I am trying to make that we checked on posted prices yesterday, and we are looking at $17.50 and $18.

Mr. MARTIN. I accept that certainly.

Anyway, in a low-priced scenario OPEC could return to a position of dominance.

I would like to show another chart here again just to refresh ourselves on what oil flows look like out of the Persian Gulf.

Again, it is always I think a matter of concern to see what a large percentage of the world's oil comes from the Persian Gulf even today. And in light of the recent day's events, I think you share that concern with me. That is today's situation. If the oil market again becomes dominated by OPEC, we will see the flow of oil from the Persian Gulf increase quite dramatically. Still, even today's level of dependency is a cause for concern.

It is important to note, however, that although imports are on the rise, our ability to cope with disruptions is improving because of the Strategic Petroleum Reserve. You can see that today the United States and our friends and allies can put as much as 2.7 million barrels a day onto the oil market, and we hope that by 1995 collectively we will be able to put as much as 5 million barrels a day onto the oil market. And that would give us twice as much protection as we needed during the 1970s.

It is also important to note that stocks only last for a year, and basic vulnerability continues. But we have made a lot of progress by building this SPR, and that remains our principal line of defense.

Mr. Chairman, the report was also asked to assess national security implications of rising oil imports. Again, it is our assessment that instability in the Middle East is likely to continue. We have the lingering and dangerous Iran-Iraq war. We have the rise of terrorism in the region. We have a civil war in Lebanon. We have the potential for Soviet interference, and we have the ever-present Arab-Israeli problem. So, the national security community concurs with us that rising imports represent a national security problem.

They also pose an economic problem because it is not a good idea to have a concentration of the world's production in the hands of a few because then they can act in a monopolistic way and charge whatever they like, as we saw in the 1970's.

I would also add we assessed a variety of military scenarios. Do we have adequate oil to fight a conventional war? And the answer was yes. We will have sufficient oil needs for the military, although in some of the more severe scenarios some parts of the civilian economy will be affected. That is our energy security background.

The President's letter sets out four objectives. One is to increase our domestic stockpiles. Two is to maintain a strong domestic oil industry. Three is to continue conservation and diversification of alternatives. And four is to promote complimentary policies in OECD nations, especially in the building of strategic stocks.

I have touched upon SPR, the first objective. Let me say again that we now have 520 million barrels in the SPR in Louisiana and

Texas. The President is committed to the 750 million barrel SPR by 1993. That will require an average fill rate of 100,000 barrels a day.

Secondly, as far as maintaining a strong domestic oil industry, it is important to note that the administration and the President have already taken steps to decontrol oil prices.

We have reduced industry regulation. Within the DOE itself we used to have 2,000 regulators; we now have 200.

We have retained depletion allowance and expensing of intangible drilling costs in the Tax Reform Act. We think that act last year, which the Congress of course concurred in, will save 700,000 barrels a day of production.

We have relaxed regulations that would have forced the capping of stripper wells. We have also persuaded the SEC to retain full cost accounting, which is important to the independent producers.

But, of course, the President and Secretary Herrington have also said that this is not enough. A letter to you calls for improved access to Federal lands including opening up of ANWR, reducing the minimum bid from $150 to $25 on off-shore leases, repealing the windfall profits tax, and changing two technical tax provisions repealing the transfer rule and increasing net income limitation.

Mr. Chairman, the administration remains opposed to an oil import fee. We still believe that the costs outweigh the benefits, and we will be glad to discuss that with you at today's hearing.

As I said before, we looked not only at oil, we also looked at all energy sources with particular regard to natural gas and conservation. We applaud the repeal of FUA, the actions of this committee, and also actions by the FERC to bring about more competition in the industry. But we still favor comprehensive deregulation and believe that that can save 300,000 barrels a day of oil imports and also reduce consumer bills.

We give a lot of attention to coal in the book. And here we look forward to working with the Congress to enacting the $2.5 billion five year Clean Coal Program. We believe this is the most efficient way to meet the environmental problems facing coal, and we remain opposed to more stringent requirements of our powerplants to cut emissions.

We also support coal exports. And this seems to make more sense every day. It reduces our trade deficit, provides jobs to Americans, and provides energy security to our allies. We have been working with other nations to urge them to cut their subsidies which they presently provide to their high-cost producers and to buy American coal.

Nuclear power is growing fast. We also recognize it faces problems. We want to work with you, Mr. Chairman, in enacting streamlined nuclear licensing reform, extending Price-Anderson, and continuing to make progress in developing the nuclear waste disposal system.

We put forward an interesting chapter on electricity. Here again we know electrical needs are likely to grow in the 1990s. Yet at the moment the reward-risk system facing utilities does not bring about the type of environment beneficial to the making of new capital investments. Again, this is an issue we want to look at further with you.

Conservation is important. Again, we note that we do not use any more energy today than we did in 1973. Furthermore that trend will continue as newer cars replace older cars, and newer industrial processes replace older processes. And that is one of the reasons our demand estimates remain relatively low in this study.

We have concentrated our attention on the period 1985 to 1995 because we think that is the time we face the greatest vulnerabilities. But, of course, we also recognize renewables over the longer term will play a very important role.

We note in here that we have to work closely with the Europeans and Japanese and other nations to continue to urge them to diversify their energy systems and conserve energy and build their stockpiles. The President has committed personally to raise the issue of stocks at the Venice Summit.

We also recognize that forecasting is a very imprecise science, and the President's letter calls on the Secretary of Energy to make periodic assessments of energy security, noting that if the industry is further diminished or national security is threatened, more action may be necessary.

We are instituting a broad category of energy security indicators. One important category is certainly oil imports into this country, but we also have to look at the level of OPEC production capacity, and the OPEC share of the world oil market. We need to look at oil imports into other nations. We need to look at the levels and rate of growth of our strategic stocks, and we need to look at the health of our energy industries, including the oil and coal industries and electric utilities. We believe monitoring these indicators will provide a better assessment than just looking at the issue of oil imports alone.

Let me conclude, Mr. Chairman, by saying we have worked hard on this issue. We have had a lot of high-level discussions. The President has been personally involved and briefed. He has been presented the same charts that you have been presented with the same sense of urgency that I have presented to you.

I think one of the problems we face is that beyond the oil states at the moment, nobody much cares about our energy future. I think one of the things we would like to do with the Congress is to elevate this issue up before the Congress and the American people so that we can take some cost-effective actions today to avoid the type of future which you described, a hellish situation in the 1990s, which we must—we must—avoid.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Martin follows:]

TESTIMONY OF

WILLIAM F. MARTIN
DEPUTY SECRETARY
U.S. DEPARTMENT OF ENERGY

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES
U.S. SENATE

MAY 20, 1987

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OVERVIEW

In 1986, crude oil prices fell suddenly by nearly 50 percent, stimulating U.S. economic growth and reducing inflation to levels not seen in recent decades. This price decline also forced the U.S. oil and gas industry into a depression. The price collapse sent shockwaves through the industry, resulting in substantial reductions in capital spending, the loss of 150,000 jobs, and deep setbacks in oil and gas exploration. The number of new wells being drilled in the United States fell by more than 50 percent to pre-World War II levels, and the number of seismic crews searching for oil dropped by more than one-half to levels not seen since 1934. U.S. oil production fell by 800,000 barrels per day in 1986 back to 1981 levels. As a result, U.S. imports of foreign oil have increased by 1 million barrels per day. If present trends in the United States and elsewhere continue, the world may become more dependent upon insecure sources of oil.

Recognizing the potential gravity of the situation, the President last fall requested that Secretary Herrington assess energy-related national security concerns. His report, *Energy Security: A Report to the President of the United States*, was released on March 17, 1987. It is a comprehensive appraisal of all energy sources, including renewables and energy efficiency, as well as the Nation's emergency preparedness strategy and its energy-related international activities. This assessment, done at a time when the economy as a whole has been benefiting from plentiful energy and lower prices, identifies trends that could pose risks of supply disruptions and price manipulations in the early 1990's. The report carefully lays out methodology, assumptions, and results, and it provides a solid technical data base covering a wide range of energy options.

The *Energy Security* study employed two scenarios: a *lower price* scenario in which prices stay at $15 per barrel through 1990 and then rise to $22 per barrel by 1995, and a *higher price* scenario in which prices rise to $23 in 1990 and to $28 per barrel in 1995 (1985 dollars). In the lower price case, the United States would be faced with 50 percent import levels by the early 1990's. In the higher price case, the United States also would face import levels of 50 percent, and more, but not until after 1995. As noted in *Energy Security*, the U.S. oil import level by itself is not a good indicator of our energy vulnerability. A broader worldwide perspective, such as OPEC market share, is more useful. The OPEC market share, primarily from the Persian Gulf, is projected to be between 45 and 60 percent—depending on various assumptions that characterize the higher and lower price cases, respectively. With current oil prices of more than $19 per barrel, we seem to be on the higher price trajectory. However, if oil prices should again decline significantly, we could be faced with the rapidly rising imports projected in the lower price scenario, depending on such other factors as oil stockpiles and availability of assured energy supplies.

U.S. energy policy is designed to provide adequate energy security at reasonable cost to the Nation. The President in his May 6 letter to Congress established the following goals as part of this overall objective:

- Increase our domestic stockpiles, which we can draw down in the event of a supply disruption.
- Maintain a strong domestic oil industry.
- Expand the availability of domestic oil and gas resources.
- Continue conservation and progress toward diversification of our energy resources.
- Promote among our allies the importance of increasing their stockpiles.

A great deal has been done to build the Nation's foundation for long-term energy security and to strengthen the domestic oil industry. Price and allocation controls on oil were eliminated; the Strategic Petroleum Reserve (SPR) has been increased nearly fivefold to

more than 520 million barrels; and, with our encouragement, U.S. allies and friends have increased their oil stockpiles to 350 million barrels. The Administration plans to continue pushing for even higher levels of strategic oil stocks among our allies. Secretary Herrington, at the recent International Energy Agency (IEA) Ministerial Meeting, again strongly urged further stock increases, as will the President at the forthcoming Venice Economic Summit. Several important energy tax incentives were retained in the Tax Reform Act, and full-cost accounting provisions for independent producers were preserved. Environmentally sound use of coal, one of our most abundant resources, will be enhanced by the Administration's $2.5-billion clean coal program. Because of these actions, the United States is now capable of withstanding a supply interruption comparable to the 1973 and 1979 interruptions without experiencing the same economic distress.

More remains to be done. The Administration has proposed a number of significant steps. Had these policies been in place, our domestic oil industry would not be so seriously impaired today. For example, while congressional action on the Fuel Use Act is heartening, even more progress is possible through comprehensive natural gas reform, including wellhead price decontrol and mandatory contract carriage. The Administration has proposed repeal of the windfall profit tax and approval of the Department of the Interior's five-year offshore oil and gas leasing plan, permitting environmentally sound energy exploration and development of the Arctic National Wildlife Refuge. To ensure the future viability of nuclear power, the Administration has proposed nuclear licensing reform, reauthorization of the Price-Anderson Act, and progress in development of a nuclear waste repository. In the future, renewable energy sources can be important factors in our energy balance, and to that end, the Administration is supporting appropriate high-risk R&D. Alternative motor fuels and fuel-flexible vehicles offer possible ways to reduce our dependence on petroleum. DOE is leading a major alternative transportation fuels study and working closely with the Vice President's Task Force on Regulatory Relief, which is evaluating regulatory changes to facilitate the use of alternative fuels in the transportation sector.

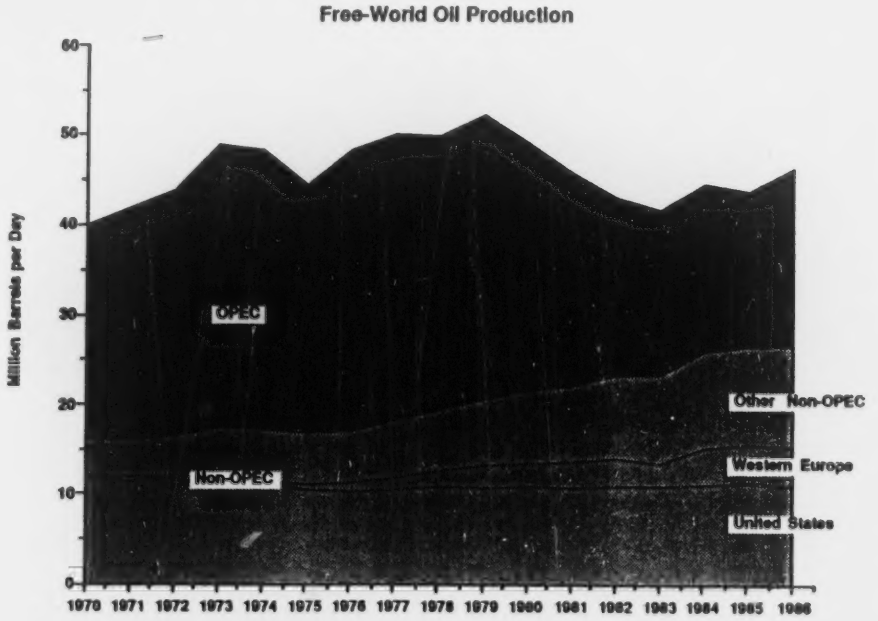
In addition, the Administration is urging Congress to consider several steps that will lead to more exploration and development, reduce early well-abandonment, and stimulate additional drilling activity. We are urging that Congress consider two tax changes of a relatively technical nature: increasing the net income limitation on the percentage depletion allowance from 50 percent to 100 percent per property, and repealing the transfer rule to permit use of percentage depletion for proven properties that have changed ownership. The Administration opposes oil import fees and additional prohibitions on oil exports. Emphasizing that the SPR is a useful supplement to market reliance, the President announced he was prepared to support filling the SPR at a rate of 100,000 barrels per day, providing additional protection in the early 1990's, provided that budget offsets are made available to cover the higher costs of the fill rate.

Because the outlook is uncertain, the President has instructed Secretary Herrington to provide him with periodic assessments of energy security risks. Due to the complexity of domestic and international markets, no single indicator provides an adequate measure of energy security. Rather, a number of indicators will be used to monitor the situation, including oil prices; OPEC and Persian Gulf share of free-world production; excess production capacity; level of free-world exploration; U.S. production, consumption, and imports; exploration and development activities; fuel substitution capability; level of government and private stocks; and political or military threats in the Middle East or oil-producing regions.

The President's program will address the problems we are confronting based on the current situation. If the U.S. oil and gas industry continues to falter and national security risks increase, he has pledged he will consider options to encourage exploration and development, as warranted. In the immediate future, however, it is essential that Congress act on the Administration's pending energy proposals, which are cost-effective and are sound measures bolstering our energy security and economic strength.

LOW OIL PRICES BRING ECONOMIC BENEFITS
BUT ALSO RAISE SECURITY QUESTIONS

Significant Progress Has Been Made in Reducing World Dependence on OPEC



OPEC - Organization of Petroleum Exporting Countries

Note: Production includes natural gas liquids, other liquids, and refinery gains

Source: U.S. Energy Information Administration

SIGNIFICANT PROGRESS HAS BEEN MADE IN REDUCING WORLD DEPENDENCE ON OPEC

- Several events in the 1970's and early 1980's precipitated a series of sudden oil price increases, which tended to remain in effect long after the end of the situations that had led to them. These oil price increases (along with associated increases in the price of other fuels, such as natural gas) spurred major efforts to reduce energy consumption, to use energy more efficiently, and to develop high-cost oil reserves and alternative energy sources. Response to high oil prices was obviously bolstered by President Reagan's action to achieve immediate decontrol of U.S. oil prices in 1981.

- Production in the North Sea grew most rapidly, accounting for about one-third of the whole increase, and Mexico accounted for another 15 percent of the production rise outside OPEC. The price increases that had piled up during the 1970's also encouraged production from countries such as Egypt, Oman, Angola, Cameroon, Brazil, Colombia, China, India, and Malaysia. The U.S. import mix shifted dramatically during the early 1980's; imports from Mexico, the United Kingdom, and Canada each surpassed the level of imports from Saudi Arabia. But in 1986 this trend halted. OPEC countries regained part of their earlier market share—by cutting prices.

- The response of the oil industry in the United States was remarkable. The number of oil wells completed each year in the United States grew at a compound annual rate of 13.1 percent, from 26,300 in 1971 to 90,000 in 1981. Employment in oil and gas production and oil-field service activities more than doubled over this period. The decline in U.S. production was even halted. This was largely because of the completion of the Alaskan pipeline, which made available oil from the Prudhoe Bay field (discovered in 1967), but also because of a multitude of minor discoveries. For a while, thanks to drilling at all-time record rates, U.S. domestic production actually increased slightly.

- At the same time, the OECD consumed slightly less oil in 1985 than in 1970 despite a GDP growth of 29 percent during that time. This achievement was the result of increased efficiency, fuel substitution, and the accelerated development of nuclear power generation.

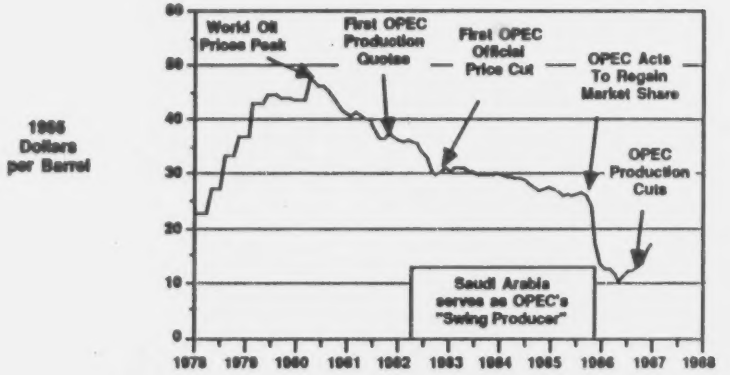
  — Free-world coal use has increased by 35 percent in the past 10 years.
  — Natural gas use is now almost as high as coal use in the free world.
  — Nuclear power has increased more than sixfold worldwide in the past 10 years.
  — Electric power consumption—largely based on non-oil fuels—has shown steady growth.

- As a result, OPEC's production of crude oil and natural gas liquids (NGL's) dropped from more than 31 million barrels per day in 1979 to about 17 million barrels per day in 1985. By contrast, non-OPEC oil production rose from about 21.5 million barrels per day in 1980 to its current rate of close to 27 million barrels per day.

- Despite efforts by OPEC to sustain prices in the face of a declining market share, in fact, oil prices fell continuously from 1981 through 1986. Adjusted for inflation, average prices in 1986 were only about $5 per barrel higher than the average prices for 1973—when the whole "energy crisis" cycle began.

Falling Oil Prices and Reduced Reliance on OPEC Have Benefited the World Economy

Average Monthly Cost of Crude Oil Imported By U.S. Refiners



Source: U.S. Energy Information Administration

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FALLING OIL PRICES AND REDUCED RELIANCE ON OPEC HAVE BENEFITED THE WORLD ECONOMY

- In general, lower world oil prices have had a positive effect on the economies of the developed countries, which use substantial amounts of petroleum in transportation, industry, businesses, and homes.

  —Lower prices for oil products (as well as for competing fuels, such as natural gas and coal) dampen inflation. U.S. inflation in 1986, for example, was the lowest level in 25 years. This, in turn, helps to keep interest rates down.

  —Having ample supplies of energy available at lower cost provides more fuel and feedstock for numerous industries—resulting in more products for final consumption.

  —As automobile owners, households, and businesses spend and invest the money they save through lower fuel costs, the economy should grow overall. This generates more jobs and higher incomes.

  —In many countries, taxes on oil consumption have reduced the benefits consumers actually receive from lower oil prices; but this has not been the case in the United States, where it has been the Administration's policy to pass such benefits along fully to consumers. The average American car owner spent about $165 less to fuel his or her automobile in 1986 than in 1985.

- Not everybody is affected in the same way by lower oil prices, however, because oil producers receive less income and consumers pay less whenever oil prices decline. This "income transfer" occurs both within countries and between countries. Certain countries (such as Norway) and some regions within countries (such as the oil-producing states in the United States) have suffered as a result of the recent drop in world oil prices.

- In the United States, lower oil prices have particularly helped certain energy-intensive industries and consumers of their products:

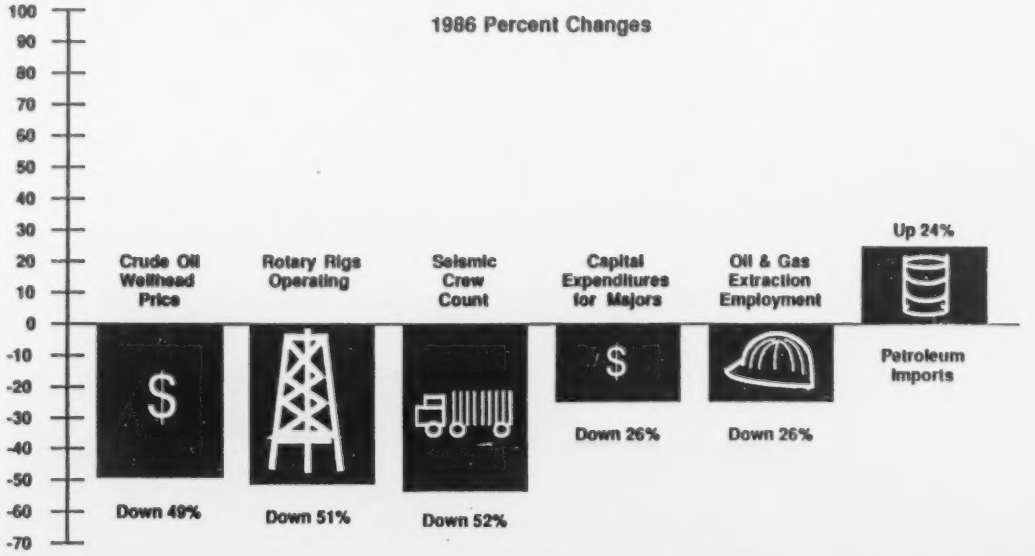
  —The chemical industry is one of the most energy-intensive. Oil and natural gas (both as fuel and feedstocks) account for 50 to 70 percent of total manufacturing costs for some basic chemicals.

  —The airline industry is highly sensitive to oil prices. Even at current low prices, fuel accounts for a quarter of this industry's costs.

  —The trucking industry also uses large quantities of oil. Ups and downs in the price of oil easily make trucking less or more competitive, as compared with alternative forms of transport.

- Lower oil prices also benefit less developed countries (LDC's) in general, although in this case the effects are less uniform. Faster world economic growth, lower inflation, and lower interest rates benefit all LDC's, but many oil-exporting LDC's have suffered directly from lower oil prices.

Despite Overall Benefits to the Economy, The U.S. Oil Industry Has Been Hurt



Source: Visual Concept, IPAA; Numbers, Department of Energy

DESPITE OVERALL BENEFITS TO THE ECONOMY, THE U.S. OIL INDUSTRY HAS BEEN HURT

- In 1986, drilling activity (as measured by rigs in use) reached a 46-year low (about the same level as before World War II). In July 1986, the rig count was below 700, compared to a 1981 peak of 3,970 rigs in use. Since July 1986, the rig count has increased; and it recently exceeded 800.

- The number of crews engaged in seismic exploration has declined steadily since 1985. The number of seismic crews employed in 1986 was more than 52 percent below the 1985 count. Seismic exploration has not been at such levels since 1934 in the midst of the Great Depression, when oil was selling at 50 cents per barrel.

- Capital expenditures for oil exploration and development have dropped by nearly 50 percent since the record high year of 1981. Such spending by major oil companies fell by about 26 percent during 1986. Independent oil producers have been especially hard hit, since they must generate investment funds primarily from external sources.

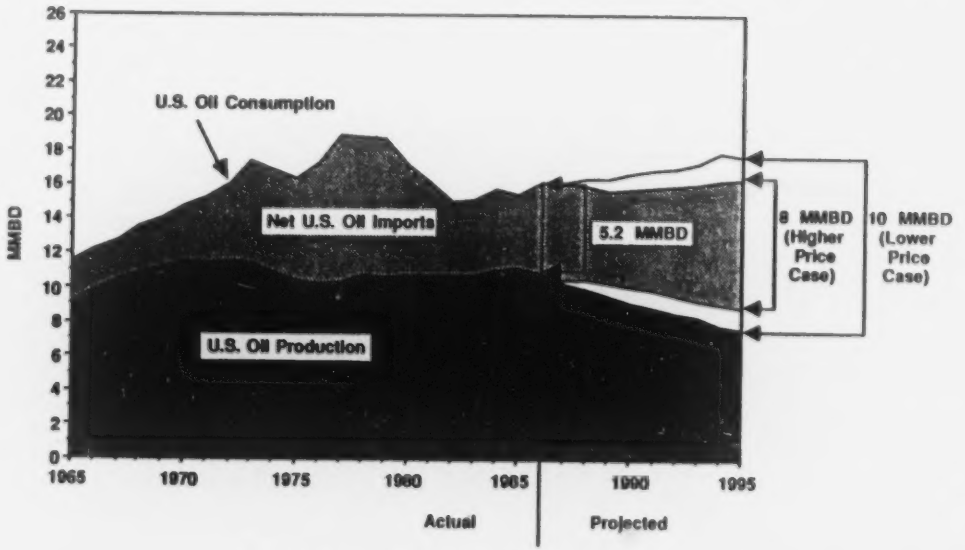
- Major oil companies' net profits remain positive, but their earnings in 1986 were down considerably. Most of these companies reported drops of between 20 to 80 percent in fourth quarter earnings. After a profitable year in 1985, the drilling industry suffered enormous losses in 1986.

- By the end of 1986, 150,000 oil industry jobs had been lost. Current oil industry employment of about 424,000 is at about the same level as in 1977. Unemployment among petroleum geologists is about 26 percent. In addition, training for petroleum engineers is way down. For example, at the University of Texas, which has one of the largest petroleum engineering programs, enrollment in the petroleum engineering department has fallen from 1,119 in 1985 to 116 in 1986, and will be down to about 60 in 1987.

- Although lower oil prices provide broad economic benefits for oil consumers, they have a serious negative impact on the major oil-producing states, such as Texas, Alaska, Louisiana, and Oklahoma. Unemployment nationally averaged about 7 percent in 1986, compared to about 14 percent in Louisiana, 11 percent in Texas and Alaska, and 9 percent in Oklahoma. In addition, the collapse of regional banks in Texas, Oklahoma, Louisiana, and other oil-producing States diminishes the funds available to local independent oil producers.

U.S. Net Oil Imports Probably Will Increase Substantially by 1995

History and Outlook for the U.S.



Source: U.S. Energy Information Administration

U.S. NET OIL IMPORTS PROBABLY WILL INCREASE SUBSTANTIALLY BY 1995

- Lower oil prices will accelerate the decline in U.S. oil production. The United States is a high-cost oil producer and therefore is particularly sensitive to price declines. During 1986, many marginal producing wells were shut in, and many exploration and development projects were postponed or abandoned. U.S. production is projected to decline from 11.2 million barrels per day in 1985 to between 7.6 and 8.9 million barrels per day in 1995.

- Lower oil prices also will stimulate higher consumption of petroleum products. In the United States, consumption is projected to rise from 15.7 million barrels per day in 1985 to between 16.4 and 17.7 million barrels per day by 1995.

- If the United States produces less oil in the future and uses more, its imports of this energy source will clearly go up. In the past, some observers have used the level of oil imports as something like a shorthand indicator of "oil vulnerability"; but it is worthwhile to note that this an oversimplification. Certainly, the level of vulnerability depends on the likelihood of supply disruptions and on the ability to respond to such events as well as on the level of dependence on imports. In addition, using import levels as the only criterion for a successful energy policy overlooks the obvious economic fact that the availability of lower cost oil imports brings down the effective domestic price of oil—which benefits all consumers.

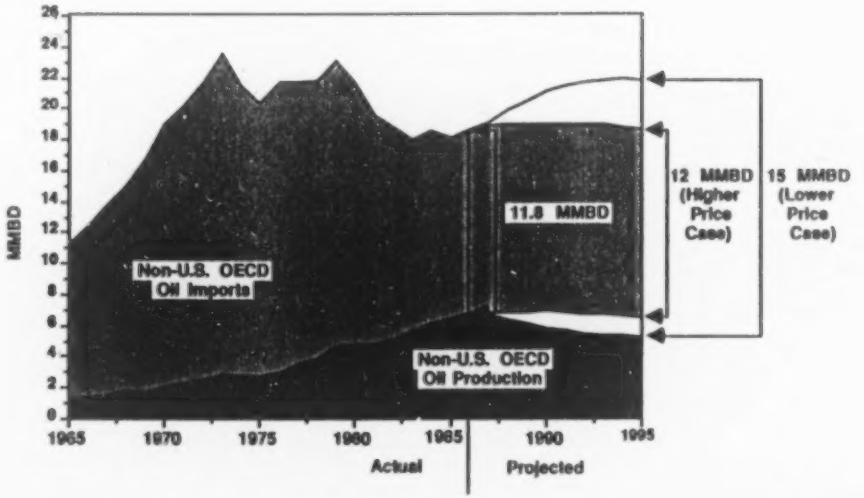
- Even before the price collapse of 1986, U.S. oil imports were expected to rise during the late 1980's and early 1990's. Now it is likely that the recent decline in oil prices will lead to somewhat faster and larger growth in imports. The size of the increase is highly uncertain; but it will depend in particular on how low oil prices go, how long they stay low, and how large the resulting demand and supply responses are.

- Net U.S. imports of crude oil and petroleum products were cut in half between 1977 and 1985—falling from a high of 8.6 million barels per day to only 4.3 million barrels per day. During 1986, partly in response to lower prices of the fuel, oil imports climbed by about 1 million barrels per day above the 1985 level. However, about one-third of these increased imports can be explained by expansions of U.S. inventories of oil and oil products.

- Over the longer term, U.S. oil imports could exceed the range they reached in the mid-1970's. The projections in the *Energy Security* report show U.S. net oil imports in the range of 8 to 10 million barrels per day in the mid-1990's—about one-half or more of total projected U.S. oil consumption.

Non-U.S. OECD Oil Imports Also Are Likely To Rise

History and Outlook for Other OECD Countries



Source: U.S. Energy Information Administration

NON-U.S. OECD OIL IMPORTS ALSO ARE LIKELY TO RISE

OECD Countries

- The United States' partners in the Organization for Economic Cooperation and Development (OECD) depend substantially as a group on importing oil to keep their economies operating normally. If prices stay low over the long term, non-U.S. OECD oil production is likely to decline while consumption increases (despite continuing conservation gains). The projections in the *Energy Security* study show this group's net oil imports rising from 11.6 million barrels per day in 1985 to about 12 to 15 million barrels per day in 1995. This level of oil imports would represent 65 to 75 percent of total consumption—considerably higher than the import share projected for the United States.

- In Western Europe, energy demand growth is expected to be modest, due in part to high fuel taxes in some countries. Oil production in the UK sector of the North Sea will soon begin to decline, and projected increases in Norwegian oil production will be insufficient to maintain overall North Sea production at current levels. Thus, modest consumption growth and production declines will contribute to higher net imports. Overall Western European oil import levels are projected to increase to between 65 and 75 percent of total consumption. Natural gas and coal can play a larger role in Europe in the future. Although nuclear power currently plays a large role in some European countries, there are concerns about public willingness to accept continued growth in the use of nuclear power. If nuclear power development is stopped or delayed in Europe, electric utilities there may have to turn to increased use of gas, oil, and coal.

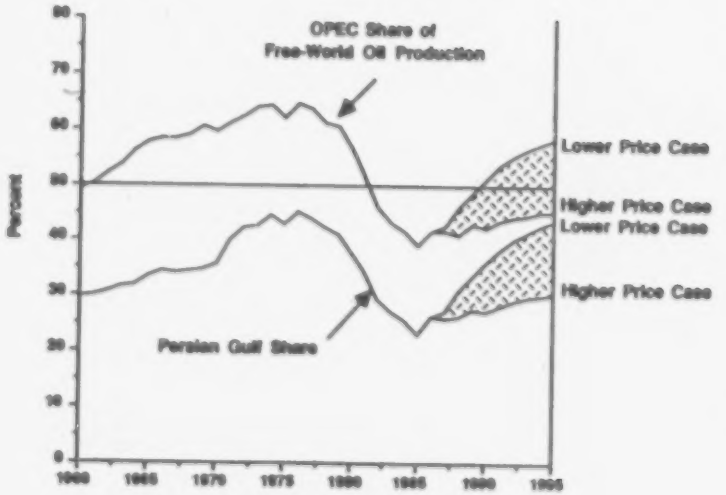
- Japan has very limited indigenous energy resources and therefore imports most of its supplies. Energy demand in Japan is expected to continue rising; but the rate of increase will probably be less than it has been because of a projected slowdown in economic growth there. Oil is the primary fuel in Japan, and almost all oil supplies are imported, with Persian Gulf countries supplying about 60 percent of Japan's oil. Liquefied natural gas imports into Japan are increasing because of the preference of many consumers for that clean-burning fuel. Coal use for energy purposes also is increasing in Japan, as is nuclear power. Japan is trying to reduce its dependence on imported oil, and these ongoing efforts are expected to curb future increases in net oil imports. Oil imports are projected to rise from the 1985 level of 4.3 million barrels per day to a range between 4.4 and 4.6 million barrels per day in 1990 and to between 4.4 and 4.8 million barrels per day in 1995.

Less Developed Countries

- Oil consumption in the less developed countries (including those LDC's that are members of OPEC) is projected to grow faster than in the industrialized nations. These countries' populations are growing rapidly, and their economies are expanding. Oil consumption also tends to increase as populations migrate from rural to urban locations. Finally, many LDC's subsidize the prices of oil products.

- Because of the huge disparity in economic, population, financial-resource, and other factors in countries as diverse as South Korea, India, Egypt, and Brazil, there will be large variations in future patterns of oil imports. Despite this lack of homogeneity, it seems fairly clear that growth in oil consumption will outweigh the increase in oil production between now and 1995 in those LDC's that are not part of OPEC. On balance, their net oil imports are expected to increase.

Rising Imports Imply Growing Reliance on OPEC Oil, Especially From the Persian Gulf



Source: U.S. Energy Information Administration

RISING IMPORTS IMPLY GROWING RELIANCE ON OPEC OIL, ESPECIALLY FROM THE PERSIAN GULF

- If the United States and other countries import more oil between now and 1995 as projected, production is virtually sure to rise in OPEC—and in particular around the Persian Gulf. This is because of the large oil resources available in these countries:

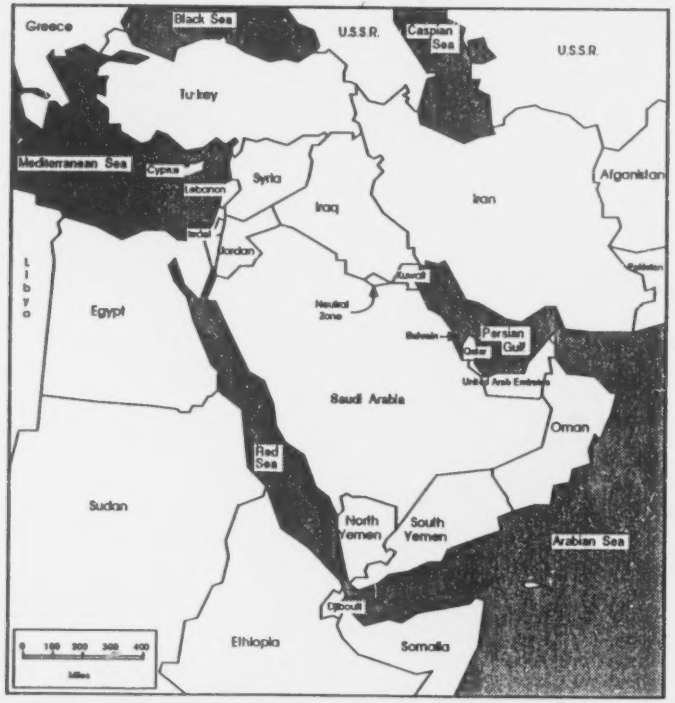
  —Of all the known oil reserves that can be recovered economically with current technology at today's prices, some 63 percent are in the region surrounding the Persian Gulf. An additional 13 percent of the world's reserves are held by other OPEC countries outside the Persian Gulf, a substantial portion of which is in Venezuela. Non-OPEC countries hold only 24 percent of world reserves.

  —Persian Gulf and other OPEC producers account for virtually all of the world's surplus oil production capacity. Whereas most non-OPEC producers seek to produce as close as possible to capacity, OPEC countries have restrained production below capacity to support higher prices. OPEC countries therefore have about 10 million barrels per day of surplus production capacity that can be quickly brought into use as demand for OPEC oil increases. Two-thirds of this surplus capacity is in the Persian Gulf.

- The OPEC share of free-world oil production rose from 50 percent in 1960 to more than 60 percent in the 1970's before falling below 40 percent in 1985. OPEC's production share is projected to increase again to between 45 and 60 percent by 1995. The Persian Gulf's production share grew from 30 percent in 1960 to more than 45 percent in 1976 before falling to 23 percent in 1985. Its share of world production in 1995 is projected to be between about 30 and 45 percent.

- Although worldwide dependence on Persian Gulf and other OPEC suppliers may rise to levels similar to those experienced in the 1970's, this does not imply the same level of vulnerability. Strategic stocks held by the United States and in other major oil-importing countries could easily exceed 1 billion barrels of drawdown capacity by the mid-1990's. In addition, inappropriate policies pursued in the 1970's, such as price and allocation controls in the United States, have been abandoned. Finally, industrial users and utilities now have a greater capability to switch among fuels.

The Concentration of the World's Oil Resources in The Persian Gulf and Other OPEC Countries Has Economic, Foreign Policy, and Military Implications



THE CONCENTRATION OF THE WORLD'S OIL RESOURCES IN THE PERSIAN GULF AND OTHER OPEC COUNTRIES HAS ECONOMIC, FOREIGN POLICY, AND MILITARY IMPLICATIONS

- There are certain risks involved with dependence on the Persian Gulf region for a large share of the free world's oil supplies. The area is potentially vulnerable to external threats, and it also is subject to the turmoil of internal conflicts. Recent Middle Eastern history shows that oil supplies from there can be interrupted. One need only cite the oil embargo and production cuts of 1973-74, the Iranian Revolution of 1978-79, and the Iran-Iraq war—which continues today after more than 6 years of fighting. Furthermore, many elements contribute to continuing instability in the Middle East:

  —The war between Iran and Iraq affects not only oil production in both countries, but also oil transportation in the Gulf.
  —The longstanding Arab-Israeli dispute is a continuing threat to the whole region.
  —The civil war in Lebanon has involved other countries in the area, and it tends to influence many political decisions by those nations.
  —The influence in this part of the world of radical ideologies contrary to U.S. interests cannot be denied.
  —Attempts by the Soviet Union to undermine U.S. influence and interests in the area must always be considered.

- Reliance on OPEC also involves risk for our economy. For approximately a decade following the 1973-74 Arab oil embargo, OPEC countries maintained oil prices at artificially high levels. Over the past few years OPEC has agreed several times on specific production quotas for its members and has sought complementary cutbacks in production from nonmember countries. OPEC's shrinking share of the world oil market in recent years prevented the organization from keeping oil prices high, but it remains uncertain whether OPEC will try (or will be able) to exert the same degree of upward price pressure as it did in the past when its market share rises in the future.

- Increased future dependence on Persian Gulf and other OPEC producers sharpens the possibility of a steep price increase at some point, resulting either from a supply disruption or from major producers' exercise of their market power. By the mid-1990's, the United States and its partners could draw down strategic stocks and most likely mitigate the sharp price increases experienced in the past even for net interruptions twice the size of those occurring in the 1970's. In the highly unlikely event of an extremely large, temporary disruption in supplies occurring in the mid-1990's, the GNP loss is estimated at 1 to 2 percent for a year—about the same magnitude as the recession experienced in 1981-82. There would be a temporary effect on terms-of-trade, because of higher import bills during the disruption plus losses in economic efficiency.

- The risk of future supply disruptions affects national security and the conduct of U.S. foreign policy to the extent that (1) the foreign policy actions of our allies are affected as they respond to perceived vulnerabilities and as rivalries for "scarce" supplies undermine allied solidarity; (2) the United States loses some flexibility in responding to disruptions, so that it becomes more difficult to reach peaceful resolutions of disputes; or (3) oil supply disruptions coincide with a major defense emergency, complicating an already troublesome situation.

- U.S. and allied defense requirements must and can be met in all circumstances. In a major conventional war, direct military consumption of petroleum products would likely be double or triple peacetime levels. Nevertheless, this substantial increase in direct military consumption would represent a relatively small proportion of normal U.S. consumption. Ensuring that defense needs are met may mean that other discretionary petroleum demands would yield to meet priority national security requirements in an emergency.

THE ADMINISTRATION'S APPROACH TO THE PROBLEM

19

The Administration Has a Broad Set of Policy Objectives

The Goal:

Adequate Energy Security at Reasonable Cost

Strategies:

- Maintain adequate strategic oil stocks
- Maintain a strong domestic oil industry
- Conserve and diversify energy resources
- Foster international cooperation

THE ADMINISTRATION HAS A BROAD SET OF POLICY OBJECTIVES

- The general policy objective is to provide adequate energy security at reasonable cost to the Nation. Achieving this objective requires balancing a number of objectives, including:

  —National security.
  —Competitive economy.
  —Environmental quality.
  —Federal budget.
  —Trade.

- We must take steps to better protect ourselves from potential oil supply disruptions and increase our energy and national security. Within a market framework, the President's goals in this area are to:

  —Increase our domestic stockpiles, which we can draw down in the event of a supply disruption.
  —Maintain a strong domestic oil industry.
  —Expand the availability of domestic oil and gas resources.
  —Continue conservation and progress toward diversification of our energy resources.
  —Promote among our allies the importance of increasing their stockpiles.

- Energy markets are international. We cannot achieve energy security solely through domestic actions. The gains we achieve can either be enhanced or dissipated by actions taken in other countries. We need both international and domestic strategies to achieve policy objectives.

- International strategies include fostering cooperation of all nations to ensure complementary actions. Secretary of Energy John Herrington helped advance such cooperation at the IEA Ministerial held May 11, 1987. At the Ministerial, and through other activities, the Administration stresses the following international strategies:

  —Increased size and improved coordination of IEA strategic oil stockpiles.
  —Reduced government intervention and removal of barriers to trade.
  —Development of a balanced, economic, and diversified energy supply system in response to market incentives.
  —Promotion of international collaboration on R&D.

Administration Actions Have Helped

- Eliminated price and allocation controls
- Built 500-million-barrel SPR
- Encouraged expansion of allied stocks (350 million barrels)
- Supported retention of percentage depletion and expensing of intangible drilling costs in tax reform bill
- Retained full-cost accounting provisions by SEC
- Extended stripper well plugging deadlines on Federal lands
- Promoted approval of FERC Orders 451 and 436 to raise old gas prices and improve gas transportation
- Supported development of Sleipner/Troll to limit Soviet gas exports
- Lifted the foreign policy controls on the exports of petroleum equipment and technology
- Initiated $2.5-billion clean coal program

ADMINISTRATION ACTIONS HAVE HELPED

- The Administration has contributed to this Nation's foundation for long-term energy security and to strengthen the domestic oil industry.

  —Price and allocation controls were eliminated in 1981.

  —The Strategic Petroleum Reserve has been increased nearly fivefold to more than 520 million barrels. The SPR drawdown and distribution procedures are continually reviewed and upgraded.

  —With our encouragement, the Nation's IEA partners hold about 350 million barrels of government-controlled oil stocks, and another 500 million barrels of accessible stocks in commercial hands. Japan, Germany, and the Netherlands are buying stocks at a rate exceeding 100,000 barrels per day for their government-controlled reserves.

  —The Administration supported several important energy tax incentives in the Tax Reform Act that would avert the loss of 700,000 barrels per day of domestic oil and gas production:

  - Independent producers will continue to deduct in full intangible drilling costs; the most significant of these is contract drilling.

  - Percentage depletion for independents was retained at the 15-percent level, thereby maintaining a significant production incentive.

  —The Administration extended the stripper well plugging deadlines on Federal lands to 1 year to prevent the premature abandonment of stripper wells.

  —The foreign policy controls on the export of petroleum equipment and technology were lifted in early 1987, opening the largest potential market for sales in the coming decade.

  —FERC Orders 451 and 436 raised old gas prices and encouraged open access to gas transportation. These actions provide approximately 75,000 barrels of oil equivalent.

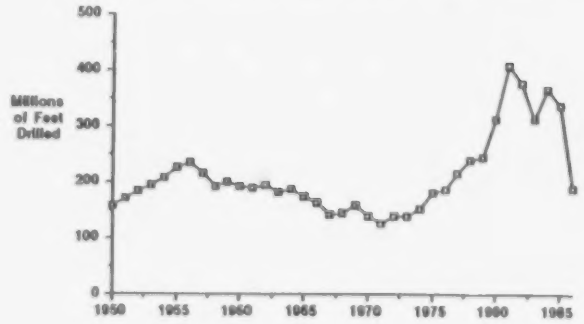
  —The successful conclusion of the signed contract for the purchase of Norwegian gas from the Sleipner/Troll fields will effectively preclude significant additional sales by the Soviet Union into the Western European market. Administration support over the last several years helped to ensure diverse supplies of natural gas to the Nation's partners.

  —The President has recently committed $2.5 billion for clean coal technology research. These new technologies could not only be used to make existing coal-burning facilities cleaner and more efficient, but also make possible creation of new state-of-the-art facilities.

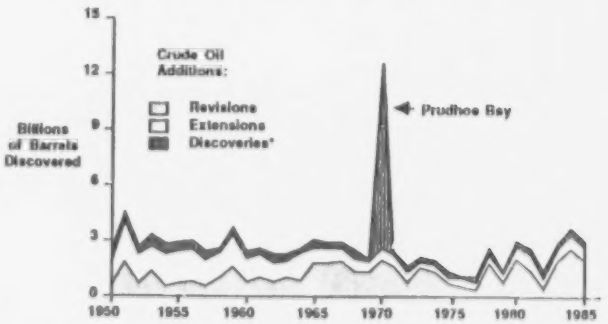
A BALANCED AND MIXED ENERGY SUPPLY SYSTEM WILL ENHANCE LONG-TERM SECURITY

A Competitive U.S. Oil Industry Is Vital to Energy Security

Oil and Gas Footage Drilled in the United States



Estimated Additions to U.S. Crude Oil Reserves



* "Discoveries" include new reserv oirs in old fields as well as tota lly new fields

A COMPETITIVE U.S. OIL INDUSTRY IS VITAL TO ENERGY SECURITY

- Lower oil prices and uncertainty about future prices raise concerns about the future vitality of the U.S. oil industry. Despite the industry's ability to respond rapidly to the price increases of the 1970's, there are four areas of concern about the ability of the industry to sustain adequate levels of investment in new reserve additions and to respond efficiently to future oil price increases:

  —**Lower Oil Prices and Price Expectations.** The oil price decline since 1981 and the price collapse in 1986 with a partial recovery since then have lowered oil price expectations, which will likely dampen investment.

  —**Financing.** Independents, who depend largely on external funds for investment, will have difficulty attracting funds to support drilling activity. Lending institutions, faced with many nonperforming loans, will be more cautious about approving new loans.

  —**Skilled Workers.** With the very large layoffs of oil industry personnel in 1986, a skilled cadre of drilling rig workers, petroleum engineers, and geologists has retired early or taken other jobs. This and other reasons may create delays in building the oil infrastructure back to full strength.

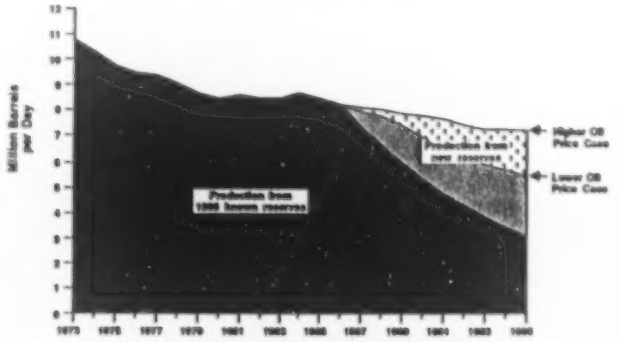
  —**Inventory of Economic Prospects.** A backlog of economic oil prospects was built up in the wake of U.S. oil price controls during the 1970's. That backlog was eliminated during the intense drilling of the late 1970's and early 1980's, but currently few new prospects are being developed. If prices increase, reserve additions (especially in the form of revisions and extensions of known reserves) may not develop as quickly as they did in the past, because fewer promising areas have been identified.

- Given all the potential delays between the industry's perception of new economic incentives to expand drilling activity and the resulting increase in U.S. oil production, there are legitimate concerns about the ability of the U.S. oil industry to make its full contribution to the energy security of the United States in the 1990's. These concerns will grow if exploration and development activity remains at low levels for the next several years.

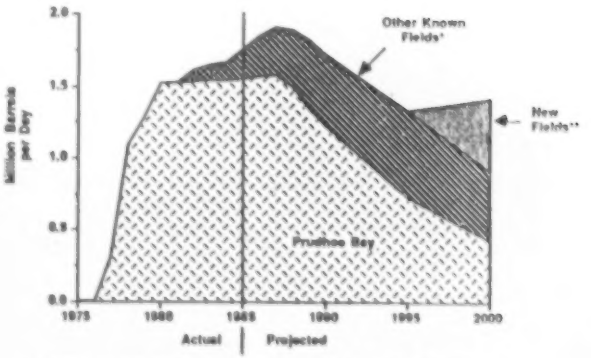
U.S. Oil Production Is Declining, but Extensive Reserves Remain

Crude Oil Production From the "Lower 48"

(Includes Natural Gas Liquids)


Million Barrels per Day
Production from 1995 known reserves
Production from new reserves
Higher Oil Price Case
Lower Oil Price Case

Alaskan North Slope Oil Production



*Includes Kuparuk, Lisburne, Milne Point, NGI Project, Gwydyr Bay, Point Thompson, Seal Island, and West Sak.

**Includes potential development of the Arctic National Wildlife Refuge (ANWR).

U.S. OIL PRODUCTION IS DECLINING, BUT EXTENSIVE RESERVES REMAIN

- Primarily because of the collapse in oil prices during 1986, U.S. crude oil and NGL production declined last year by close to 800,000 barrels per day. "Lower 48" production is projected to decline, with the decline being faster or slower depending upon oil prices, government policies, and other factors.

- The past decline in "lower 48" production was reversed when Prudhoe Bay in North Alaska came into production in the late 1970's. Prudhoe Bay production, which peaked at about 1.5 million barrels per day, is expected to go into decline in the 1990's. The best prospects for discovering oil reserves to offset the expected decline in U.S. oil production are in the coastal plain of the Arctic National Wildlife Refuge (ANWR) and along the Outer Continental Shelf (OCS).

- ANWR has up to 9.2 billion barrels of recoverable oil, which would support production of about 1.5 million barrels per day. Exploration and development of ANWR requires congressional action. A mean estimate of the undiscovered recoverable oil underlying the OCS is more than 12 billion barrels. Substantially larger amounts of oil and gas may exist beneath the coastal plain of ANWR and the OCS, but its existence could only be verified by allowing drilling.

- Given the difficulties faced by the domestic oil industry and its importance to our energy security, the President recommended several practical actions that could make the U.S. oil industry more competitive and better able to sustain production capacity under lower oil prices:

  —**Repeal of the Windfall Profit Tax.** This tax collects no revenues but adds a significant administrative burden to the industry and threatens future profitability if oil prices increase, thus impeding investment.
  —**Access to Federal Lands.** Environmentally sound access to Federal lands, including ANWR and the OCS, could add significantly to U.S. oil reserves.
  —**Lowering Minimum Bid.** Lowering the minimum bid for Federal lease sales from $150 to $25 per acre will stimulate investment in domestic oil and gas exploration.
  —**Tax Incentives.** During tax reform legislation, the Administration urged and succeeded in retaining two tax incentives for energy security reasons that resulted in saving an estimated 700,000 barrels per day of domestic oil and gas production (expensing of intangible drilling costs and retention of percentage depletion for independents).
  The President has further recommended two technical changes to tax laws which inhibit the ability of independents to maintain production from marginal wells (the income limitation and transfer of property rules, which inhibit use of percentage depletion on marginal wells). These changes can be of significant value in maintaining marginal oil production without reopening basic issues considered in tax reform.
  - In 1986, more than 80,000 wells were abandoned, compared with about 13,000 per year in the previous years.
  - These tax changes can provide economic incentives to save early well-abandonment and increase oil and gas production more than 100,000 barrels per day of oil equivalent.

- In addition, targeting a higher percentage of Federal R&D funding toward cooperative ventures with industry and the universities to focus on advanced reservoir recovery techniques and petroleum geosciences could reduce costs and, if successful, make an enormous amount of otherwise uneconomic oil available to the Nation.

Costs of an Oil Import Fee Exceed Energy Security Benefits

Oil import fees reduce oil imports, contribute to a healthier U.S. oil industry, and may raise some Federal revenues

BUT. . .

- Import fees reduce economic growth, increase inflation, and inhibit free and fair trade
- Import fees are difficult to implement and will result in many exemptions
- Import fees transfer billions from consumers to oil producers and the Federal Government

COSTS OF AN OIL IMPORT FEE EXCEED ENERGY SECURITY BENEFITS

- Many individuals have suggested a tariff on crude oil and refined products as a good means of improving energy security. Such a fee would discourage U.S. oil consumption and would aid U.S. oil producers by raising U.S. oil prices. Improved cash flow and higher prices would raise U.S. oil production and would reduce U.S. oil imports. With lower import demand, the United States would be somewhat less vulnerable to future OPEC market manipulation. A $5 import fee, for example, could raise 1995 U.S. oil production by 230,000 to 430,000 barrels per day compared to what would otherwise occur.

- **An oil import fee has several potential benefits.** An import fee would insulate the domestic oil industry from periods of extremely low oil prices and would encourage higher U.S. oil production at all times. An import fee also would reduce U.S. oil imports and payments to foreign producers. By reducing consumption through higher product prices and increasing production through higher wellhead prices, a $5 fee could reduce 1995 U.S. oil imports by about 800,000 barrels per day.

- An oil import fee would raise some Federal revenues (but its net effects on the budget would be reduced due to the economic impacts of the fee, which raise Federal expenditures and reduce net revenues) and would increase employment in the oil industry.

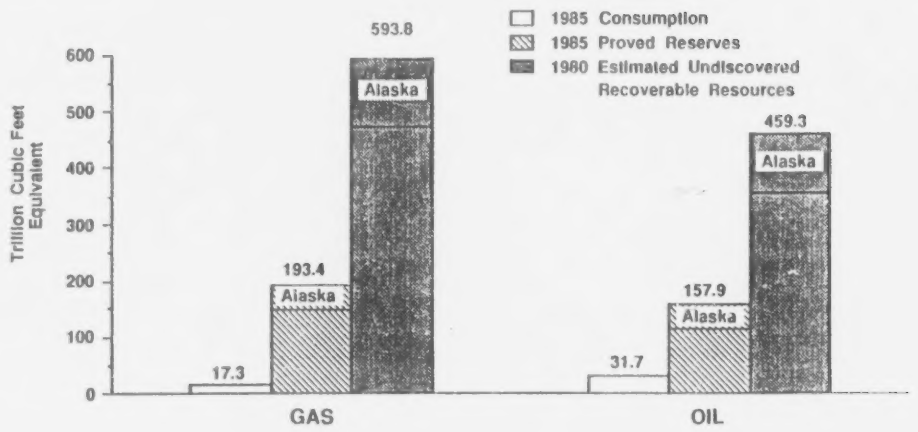
- **There are, however, significant costs to an oil import fee.** An oil import fee would raise the cost of all energy use in the United States (not just oil). Raising U.S. energy prices above levels paid by other nations would seriously reduce economic growth, increase inflation, and reduce competitiveness in world trade. A $5 fee, for example, could reduce U.S. gross national product (GNP) by about $15 billion per year and could eliminate about 3 jobs in the overall economy for each job created in the oil industry.

- An oil import fee could require government officials, not the market, to set prices through fees for different qualities of crude oils and to decide what differential to use for product imports. Exemptions to the fee or compensation would be requested by independent refiners with access only to foreign crude, by petrochemical and other energy-intensive export industries, by close trading partners like Canada and Mexico, and by others. The granting of exemptions would increase the administrative burden and complexity.

- Proposals to alter the fee to reduce the costs, such as setting a variable fee or a price floor for oil, do reduce the costs of the fee but also reduce benefits. In addition, the Administration favors eliminating the windfall profit tax and avoiding such taxes in the future. A price floor would complicate removal of such taxes and may, in fact, create an incentive for higher taxes on profits should oil prices rise substantially in the future.

Natural Gas Is Abundant and Clean and Can Substitute Readily For Imported Oil in Many Applications

U.S. Natural Gas Resources
are Comparable to Oil Resources



Source: Energy Information Administration

NATURAL GAS IS ABUNDANT AND CLEAN AND CAN SUBSTITUTE READILY FOR IMPORTED OIL IN MANY APPLICATIONS

- U.S. natural gas resources are large when compared to current domestic gas consumption. At the end of 1985, the United States had 193 trillion cubic feet (tcf) of estimated proved reserves, compared with consumption in 1985 of 17.3 tcf. Alaskan natural gas resources are substantial. In addition, the Arctic National Wildlife Refuge may have significant natural gas resources.

- Secure supplies of natural gas can replace oil in many applications, thereby freeing up oil supplies for uses in which other fuels cannot substitute.

- We applaud the progress that has been made in removing inefficient demand restraints in the Fuel Use Act and in the incremental pricing distortions of the Natural Gas Policy Act. It is essential that we build on this progress by removing remaining price controls and ensuring truly open access to pipeline transportation.

- We also are encouraged by the Federal Energy Regulatory Commission's action in addressing regulatory impediments to an efficient natural gas industry.

- Despite improvements, remaining regulations encourage inefficiencies throughout the gas industry. In 1985, it was estimated the NGPA price ceilings then in effect prevented the economic production of 30 to 34 tcf of old, low-cost gas. An estimated 11 to 14 tcf of that total was made economic by FERC Order 451, which permitted producers to seek the highest ceiling price allowed by the NGPA.

- Willing buyers and sellers cannot always deal directly with each other, since pipelines generally control access to the transportation system. Pipelines can shut in low-cost gas to alleviate take-or-pay liabilities, but lack of access to transportation prevents selling these supplies to consumers. FERC's Order 436 is a transitional mechanism that subjects natural gas industry participants to increased market discipline. The growing experience under Order 436 underscores the need for completing the transition to open-access transportation.

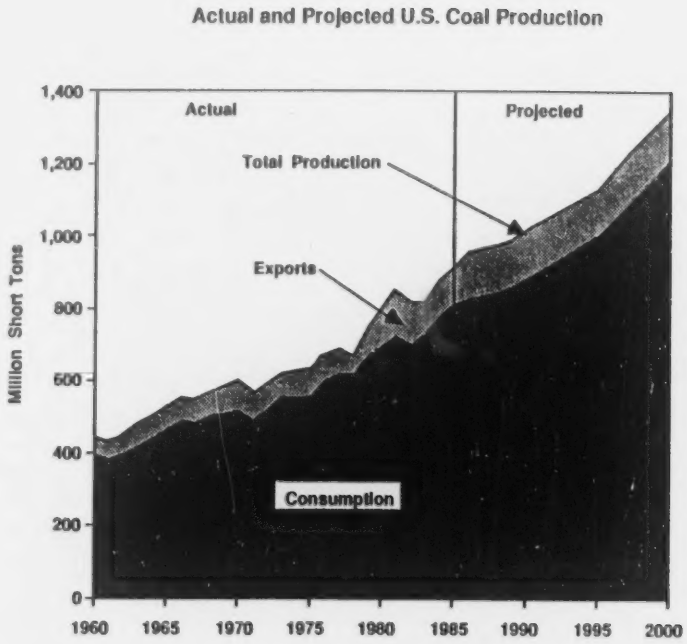
- A freer gas market would benefit consumers, the energy industry, and the Nation. Decontrolled prices will allow a competitive gas industry to ensure adequate supplies at competitive prices.

- Open access will allow willing buyers and sellers to deal directly, facilitating an orderly, competitive natural gas market in which producers have access to a large number of consumers, and consumers, in turn, have access to a large number of producers.

- The combination of regulatory reforms and comprehensive legislation could increase the competitiveness of natural gas, lower prices paid by consumers, and reduce U.S. imports by as much as 325,000 barrels per day of oil equivalent.

- Eliminating government controls and restrictions on the natural gas industry, as proposed by the Administration, would have a positive effect on the economy and on energy security similar to the effect which followed from elimination of controls on oil markets in 1981.

Clean Coal Is the Key to Coal's Future



CLEAN COAL IS THE KEY TO COAL'S FUTURE

- Coal is our most abundant fossil fuel resource, and the United States has the free world's largest coal reserves. Since the energy shocks of 1973, coal has increased its share of total U.S. energy consumption from less than 18 percent to nearly 24 percent.

- Coal can do more to promote U.S. economic growth and protect our energy security—if technical and unneeded regulatory barriers at each stage of the "coal supply cycle"—production, transportation, and consumption—are reduced.

- Expanding demand for coal can produce dramatic benefits. Demonstrating and deploying clean coal technologies are the keys to increasing consumption. These technologies will provide several benefits:

  —Clean coal technologies can substantially reduce emissions in a significantly more cost-effective manner than the current technology, flue-gas scrubbers.
  —These new technologies make costly and possibly misdirected new emission control laws unnecessary, which is one important reason why the Department will continue to fight more stringent emission standards that foreclose a clean coal technology contribution.
  —Some clean coal technologies will increase the efficiency of burning coal.
  —Clean coal technologies will provide U.S. industry with a competitive advantage in developing new domestic markets for coal, and in expanding export markets for U.S. coal and coal technology.
  —The Innovative Clean Coal Technology Program announced by the President will provide $2.5 billion to help reduce the technical and regulatory risks of investing in clean coal technology and will help ensure that clean coal electricity plants will be available when new generating capacity is required in the next decade.

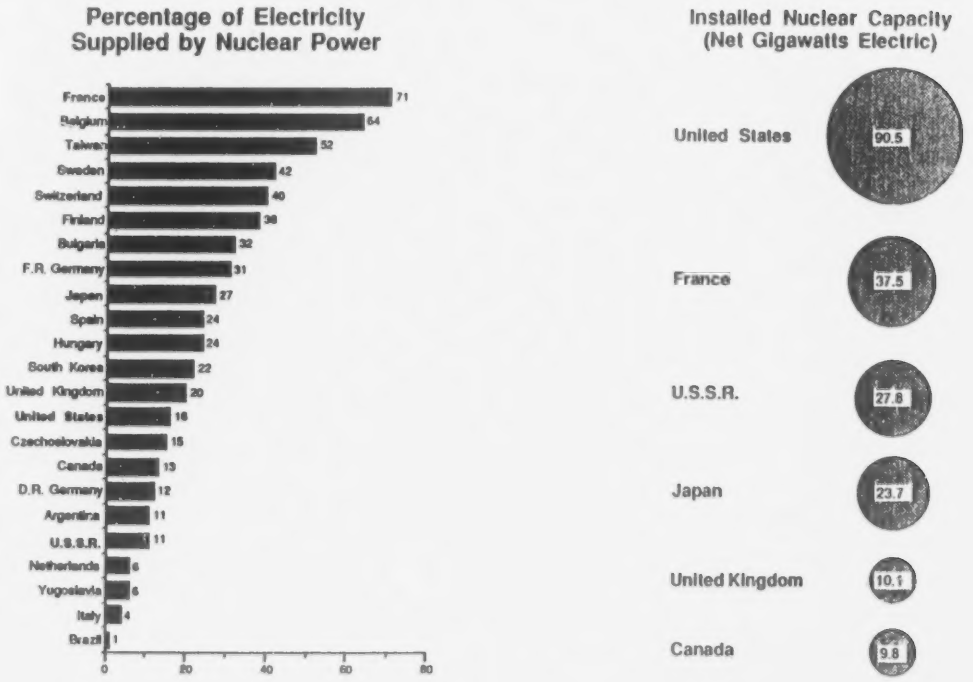
- To compete with more convenient oil and gas, and in export markets, coal production must continue the large productivity gains made in recent years. The Federal Government can play an important role in removing unnecessary regulatory obstacles to more efficient coal production. Two areas where an examination of current policies may uncover more effective solutions are:

  —Ensuring that mining and reclamation regulations protect our health, safety, and environment in a timely and cost-effective manner.
  —Determining that Federal coal leasing policies do not constrain exploration and development of our least-cost federally owned coal reserves.

- Minimizing the cost of shipping coal is also crucial to keep it a competitive fuel choice, both domestically and internationally. The Federal Government should work to ensure that competitively priced transportation is available to all coal shippers, and to monitor the regulatory process that protects "captive shippers" from abusive pricing.

- U.S. coal exports face an additional challenge. Some foreign governments subsidize their coal industries, which unfairly and unwisely reduces demand for U.S. coal. The Department has consistently pressed for the abandonment of such trade practices by U.S. trade partners, and will continue to do so.

Nuclear Power Plays an Important Role Worldwide, But Questions Remain



NUCLEAR POWER PLAYS AN IMPORTANT ROLE WORLDWIDE, BUT QUESTIONS REMAIN

- Nuclear power will be the fastest growing supplier of electricity worldwide through 1990.

- By the early 1990's, the countries that have been trying to displace oil in electricity generation with nuclear power will have completed most of the job.

- The hundreds of nuclear powerplants supplying electricity right now worldwide supply the equivalent of more than 7 million barrels per day of oil—at a time when only 55 million barrels of oil are produced each day in all.

- Nuclear power has given some countries, such as Japan and France, an economic edge in export markets.

- Nuclear power's future is likely to depend upon whether three conditions can be satisfied:

  —Nuclear power must be able to compete with other sources of electricity supply in the marketplace on its economic merits, as it did in the United States in the early 1970's and as it does in many other countries now.

  —The safety of existing and future nuclear powerplants must continue to be satisfactorily demonstrated, so that general public acceptance is restored.

  —Progress must be evident in the siting and building of high-level waste-management systems in a safe and publicly acceptable manner.

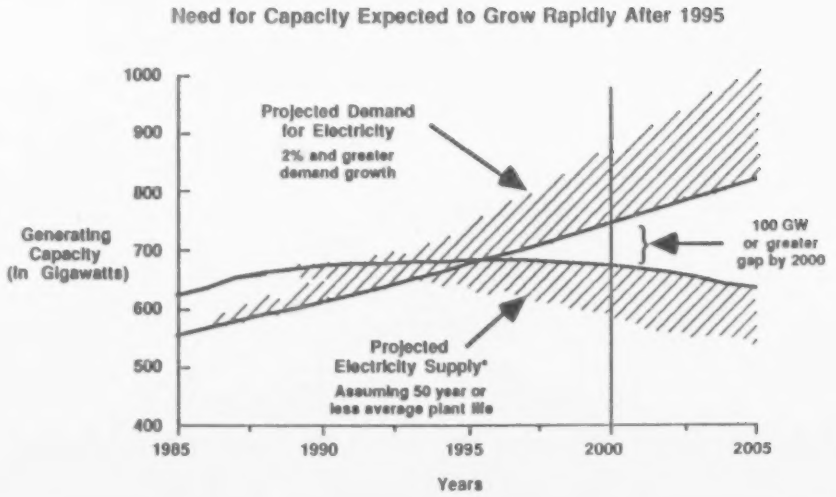
- In the United States, utilities will be unlikely to order new plants until several interrelated issues are satisfactorily resolved. These include:

  —Enactment of nuclear licensing reform and reauthorization of the Price-Anderson Act. (The Price-Anderson Act currently provides up to $705 million per incident of indemnification if needed in the case of nuclear accidents, and ensures that claims would be paid promptly.)

  —Establishment of an appropriate balance between prospective risks and prospective rewards for utilities that invest in new capital-intensive generation.

  —Continued forward progress in the deployment of satisfactory waste-management systems.

The Traditional Compact in Electric Utility Regulation Is Broken—New Approaches are Required



*Existing plants plus plants under construction minus retirements.

THE TRADITIONAL COMPACT IN ELECTRIC UTILITY REGULATION IS BROKEN—NEW APPROACHES ARE REQUIRED

- A reliable and economically efficient electricity supply system is critical to energy security because it is the primary channel through which non-liquid energy alternatives to oil can be converted into a usable form and delivered to end-use markets.

- Under cautious assumptions (2 percent demand growth and 50-year average plant lifetimes), in the year 2000 the Nation will need approximately 100 gigawatts of new electric generating capacity (beyond plants now under construction) to maintain adequate electricity supplies. If higher demand growth or shorter useful lives are assumed, the projected amount of new capacity needed becomes substantially larger.

- Part of this requirement can be met through additional utility programs for efficiency improvement and load management, though the probable size of these contributions is still difficult to estimate. Nevertheless, substantial amounts of new generating capacity of some type also will be needed.

- As electric power markets move from the current period of excess capacity to a period when additional capacity is required, the nature of the regulatory debate will change radically. At present, the regulatory process is generally focused on the contentious equity issues of deciding who will shoulder the costs of past mistakes. As the need for new capacity becomes more apparent, the process will have to refocus on how to encourage producers to make efficient decisions to ensure future supply adequacy.

- The strains of allocating the costs of past mistakes have caused a breakdown in the traditional "regulatory compact" under which utilities assumed limited risks in return for limited rewards. Now, utilities find that the risks associated with new investments have become much greater, while the rewards remain limited. Accordingly, many utilities have become reluctant to make new capital-intensive investments, even if such investments are likely to be economically beneficial to the customer over the long term.

- The Department of Energy will make a sustained effort to evaluate and promote regulatory reforms that will:

  —Increase the efficiency of the electric power industry, thus strengthening the U.S. economy and enhancing national energy security.

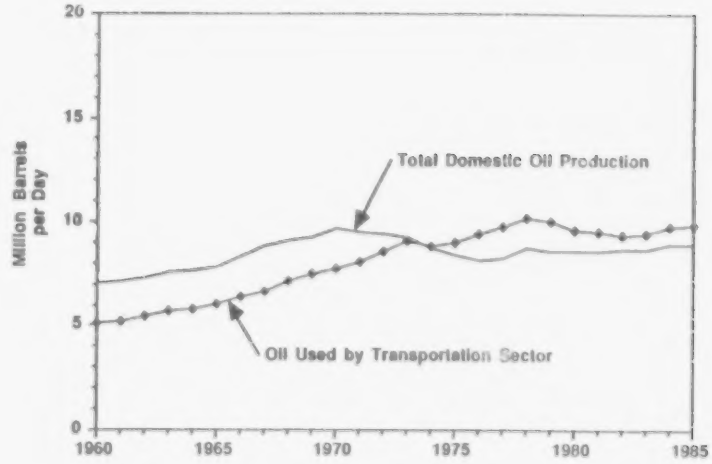
  —Increase the industry's reliance on market forces to guide both its choices among competing technologies and the timing of its basic investment decisions.

  —Improve the regulation of matters that cannot be handled exclusively by the market.

  —Maintain an appropriate balance between Federal and State responsibilities for regulating electricity rates.

  —Provide a basis for nondisruptive, evolutionary change in the industry.

Energy Efficiency in All Sectors Is a Major Contributor to Energy Security, but Transportation Remains Heavily Dependent on Oil



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ENERGY EFFICIENCY IN ALL SECTORS IS A MAJOR CONTRIBUTOR TO ENERGY SECURITY, BUT TRANSPORTATION REMAINS HEAVILY DEPENDENT ON OIL

- Today, the United States uses virtually no more energy (and less oil) than it did in 1973—although its population is still expanding and the Nation continues to turn out more products and services. Without the improvements in energy productivity that have taken place since 1973, the United States would now hypothetically require the equivalent of about 14 million more barrels of oil every day.

  — Advances in technology have accounted for two-thirds of the recent energy-productivity improvements in U.S. industry and three-fourths of those in transportation—resulting in more product output per energy unit and more miles per gallon.

  — Energy efficiency also has improved in other OECD countries, although in less developed countries energy demand has increased at about the same rate as gross domestic product. Growth in energy use, especially oil, is expected to continue at high rates in many LDC's over the next decade.

- Higher energy prices have stimulated the use and development of energy technologies that are more efficient.

  —Energy consumers, responding to market forces, have made their own fuel choices or invested in various means to use energy more efficiently. Improvements in average energy efficiency can be expected to continue, despite the decline in world oil prices—but perhaps at a slower rate.

  —Some of the improvements involve long-term or permanent changes to capital stock (such as more efficient cars, better insulated homes, and more efficient industrial processes), and others represent behavioral changes (for example, more timely maintenance of industrial equipment).

- Oil will be a critical U.S. fuel for the next decade and longer, largely because American transportation and industry continue to depend heavily on petroleum products.

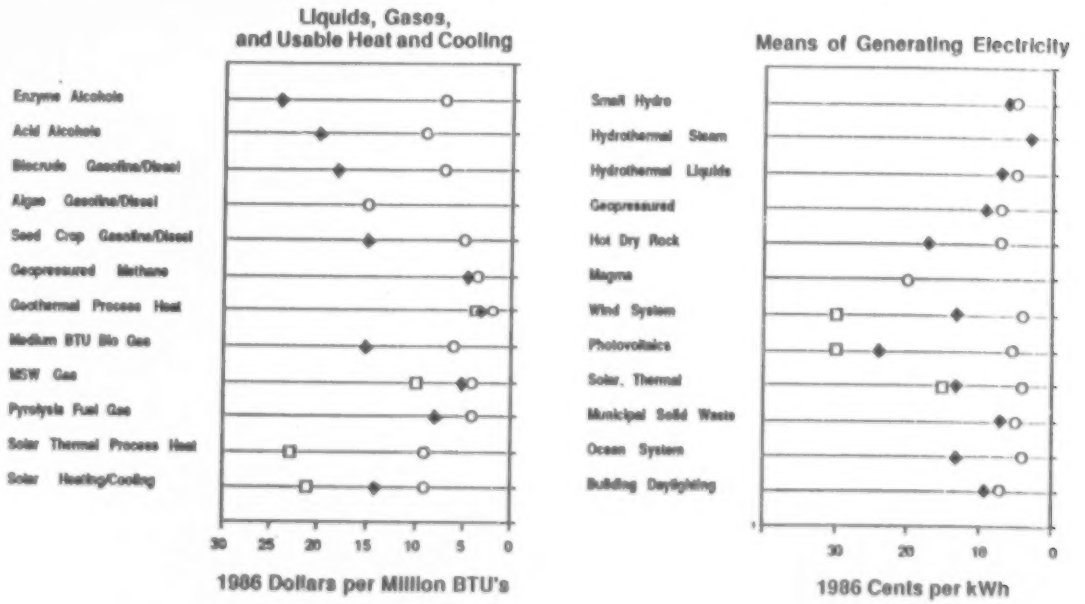
  —U.S. transportation alone uses more oil each year than the Nation produces, accounting for more than 62 percent of all U.S. oil use. Fifty-nine percent of the oil used for U.S. transportation is concentrated in autos and light trucks.

  —Alternative fuels have huge potential to displace oil use in transportation if they are cost-competitive.

- The most promising strategies for the Nation are to encourage the application of energy-efficient technologies wherever and whenever they are cost-effective, and to develop the potential for fuel flexibility in motor vehicles.

  —To this end, DOE is conducting a comprehensive cost-benefit assessment of alternative transportation fuels—including methanol, compressed natural gas, and electric power. We also are participating in the Vice President's task force on regulatory relief, which is assessing environmental benefits from the use of alternative fuels.

Renewables May Play Key Role Over the Longer Term



Key:

□ Current Average

◆ Current "Best Technology" (based on experimental data, where applicable)

○ Post-2000 R&D Goals

RENEWABLES MAY PLAY KEY ROLE OVER THE LONGER TERM

- The United States and the world will, in time, rely largely on essentially inexhaustible energy sources, including many diverse sources such as solar, wind, geothermal, water, and biomass energy.

- Achieving renewable energy's potential requires a far-sighted effort to improve the cost and performance of renewable energy.

- With improved technology, competition will cause investment in renewable energy if and when other energy supplies become more expensive.

- The majority of renewable energy used in the world now comes from large hydroelectric plants and wood fuel. Hydroelectric plants provide 20 percent of all electricity, or 8 percent of total free-world energy use.

- Current conventional renewable energy has a relatively slight growth potential. Most large hydro resources have been developed, and dispersed wood burning is not expected to increase significantly since less developed countries will use more oil, gas, and electricity for heating and cooking.

- The primary growth in renewables will be the newer technologies involving wind, small hydroelectric, solar, geothermal, ocean thermal, and biomass. Improvements in the cost and performance of these technologies will cause them to be competitive when fossil-fuel prices increase.

- The approach to achieving renewable energy's potential contribution is through a realistic, far-sighted effort to improve the technology base from which private enterprise can make development and investment decisions. Competition with more conventional energy resources, as well as among the technological approaches for renewable energy, will ultimately determine how much of this country's energy needs each technology will satisfy.

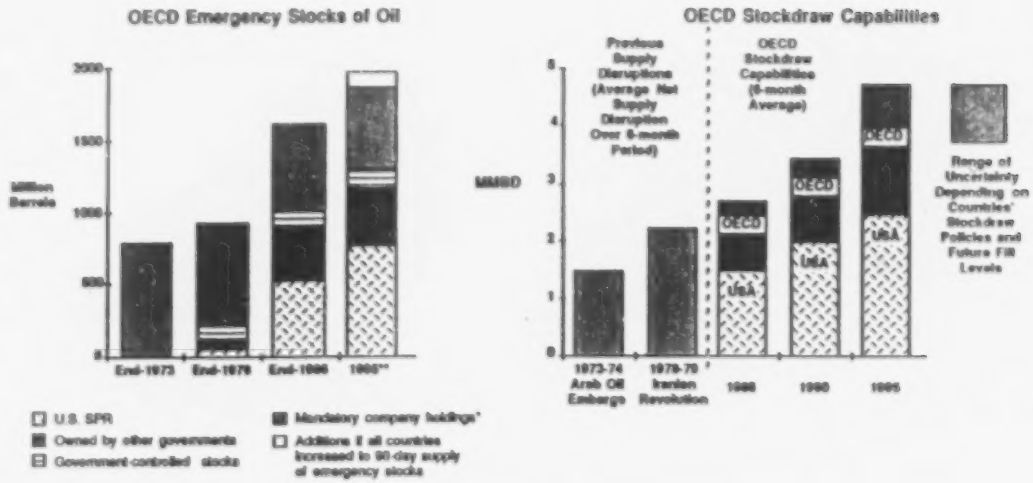
- Strategies to help the renewable *potential* emerge as *reality* include continued research and active international collaboration. DOE's renewable energy research program is structured to provide the private sector with the technology base it will need to develop competitive technologies in the critical areas required to reduce system costs, improve performance, and lengthen the operating lives of systems. It is evident that one area of special interest will be fuels from renewable resources that in time could reduce the transportation sector's dependence on oil.

- Federal leadership can help renewable technologies gain visibility while helping to improve the security of government energy supply. An example can be set by incorporating cost-effective renewable energy applications in Federal installations and buildings, both in the United States and overseas. Examples include:

  — Photovoltaic arrays have been installed at remote foreign installations.
  — The Coast Guard is now converting its lighthouse and other navigational aids to use photovoltaic devices to provide electric power, with anticipated annual savings of more than 1 million dollars.
  — The Department of Defense is now incorporating passive solar design in military housing where it is economic and consistent with basic housing needs.

INTERCONNECTED WORLD MARKETS REQUIRE
INTERNATIONAL APPROACH TO ENERGY SECURITY

Strategic Stocks Are Our First Line of Defense in an Emergency



* Private stocks in excess of operational requirements, but required by government regulations.

** Assumes a fill rate of 100,000 barrels per day until 1993, when the 750 million barrel goal is reached. Also assumes completion of other countries' announced programs to increase stocks, and no change in mandatory company holdings.

Sources: Department of Energy; International Energy Agency

RELIANCE ON MARKETS SUPPLEMENTED BY STRATEGIC STOCKS ARE OUR FIRST LINE OF DEFENSE IN AN EMERGENCY

- The United States is better prepared than ever before to deter, as well as to respond to, any energy supply emergency arising from foreign oil disruptions or from domestic incidents involving our basic energy industries. Nevertheless, the Nation must not be complacent.

- Past experience with energy supply disruptions has shown that government regulation of energy markets is a liability rather than an asset. Markets operate best when they are free of intrusive regulations, in emergencies as well as during normal periods.

- The cornerstone of U.S. energy emergency response policy is to rely on the free market, supported by the Strategic Petroleum Reserve, in an oil supply disruption. The SPR is being expanded to a 750-million-barrel capacity.

  —The President's recent decision to support tripling the SPR fill rate to 100,000 barrels per day, provided there are budget offsets, will enable the United States to meet this goal by 1993—20 years sooner than otherwise expected.

- Globally, the United States continues to participate in developing effective emergency response policy, plans and programs within the International Energy Agency and the NATO Wartime Oil Organization.

- The United States is working with other IEA governments to further build strategic oil stocks and to coordinate plans for drawing on these government stocks promptly during certain types of disruptions. As Secretary Herrington said at the recent IEA Ministerial Meeting in Paris:

  ". . . it is heartening to see that some countries are moving toward more government-controlled stocks . . . [while the] United States, under fiscal restraints as tight as any nation's right now, is moving ahead beyond the IEA obligation. Frankly, others are not. It is time for other nations to do more in taking on their fair share of building stocks."

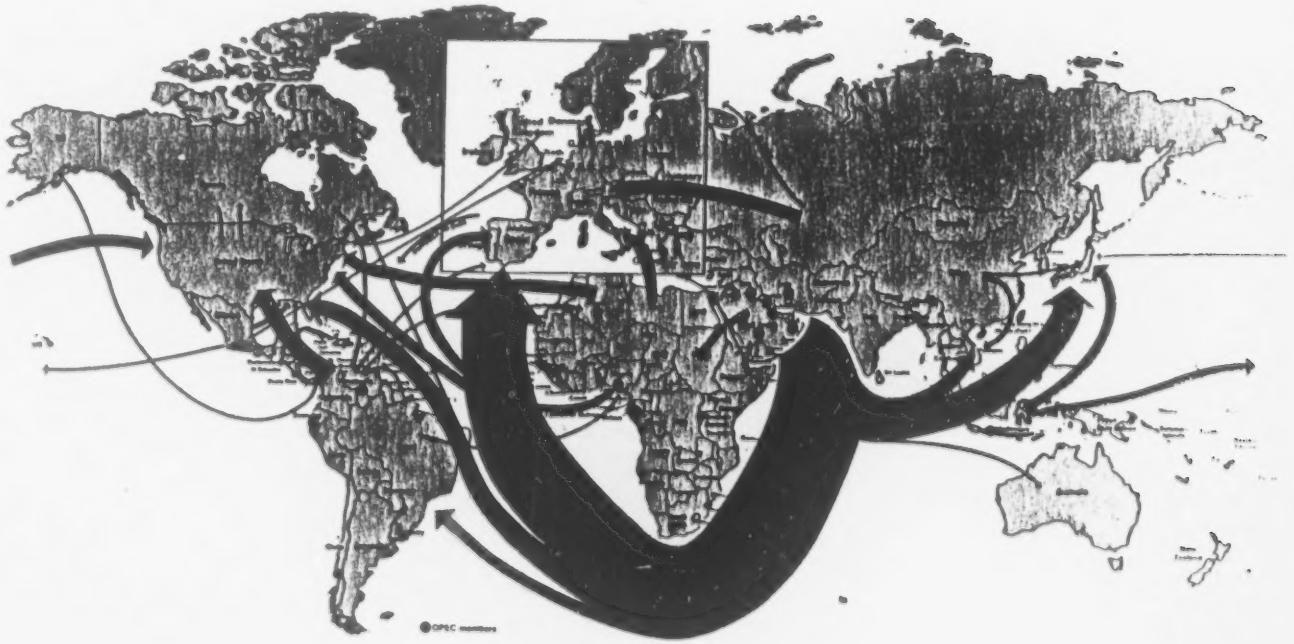
  —The OECD will be able to put 4 to 5 million barrels per day of oil onto the market in the mid-1990's. This will allow us to mitigate the impact of net disruptions larger than those experienced during the 1970's.

- Domestically, one feature of energy emergency preparedness involves ascertaining whether the Nation's energy production and distribution systems (for oil, natural gas, and electric power) are amply protected from both domestic and international threats. This involves:

  —Examining and monitoring each energy system component to determine where it is potentially vulnerable.
  —Working to reduce any recognized vulnerabilities through cooperative government-industry efforts.
  —Ensuring the strength of emergency responses through interagency, State, and local cooperation.
  —Making sure at all times that the Nation has enough energy to meet defense and other vital needs.

Complementary International Energy Policy Solutions Are Essential

Free World Dependence On OPEC Oil



COMPLEMENTARY INTERNATIONAL ENERGY POLICY SOLUTIONS ARE ESSENTIAL

- One of the key lessons learned from the 1970's was that world energy markets—especially international oil markets—are extremely interdependent. Individual nations inevitably are affected by the decisions and reactions of other major market participants—in both normal and abnormal times. A barrel of oil or oil equivalent, such as gas, or any other unit of energy that is saved, stocked, or produced anywhere in the world can contribute to collective energy security. Similarly, a large loss of supply anywhere can affect markets everywhere.

- We have made much progress since 1973. Energy is being used more efficiently—real economic growth has occurred without a significant increase in overall energy consumption, and with an actual decline in the use of oil. Non-OPEC production potential has developed significantly, and this increase, combined with expanded use of coal, nuclear power, and renewable energy, has helped limit dependence on less secure Persian Gulf oil.

- There could still be surprises in how energy markets respond to low oil prices. Thus, market developments should be monitored, emerging trends should be analyzed, and the United States should continue consulting with its allies about energy supply and demand developments. The free world should resist temptations toward either inaction or overaction.

- U.S. international energy policy reflects the domestic energy and economic policy strategies outlined earlier. The international strategy has two objectives:

  —Enhancing preparedness for any likely future energy emergency—improving the ability to mitigate harmful effects from short-term supply disruptions.

  —Removing artificial barriers that impair the operation of market forces, so that a mixed, balanced, and more flexible energy supply system can be developed efficiently—reducing the long-term problem of vulnerability related to rising dependence on potentially insecure supplies.

- As Secretary Herrington recently said to the IEA Ministers:

  "... the best way to bring about increased international cooperation is to engage in the free trade of our energy resources. ... There are strong protectionist laws and sentiments in many [IEA] countries. We must resist these hostile sentiments and counterproductive measures. ... In the United States, we have steadfastly resisted pressure to impose an oil import fee, and you are all aware of how strongly President Reagan is opposed to all forms of protectionist legislation."

- The United States and many of its allies are likely to become increasingly reliant on the Middle East's vast oil reserves. Thus, it is prudent to recall that this country shares many interests and objectives with the moderate Arab States of the Gulf. The United States can contribute much to the long-term security of energy supplies from this area by promoting those aspects of its bilateral relationships that will foster regional peace and stability.

Many Uncertainties Could Alter Our Energy Future

- Oil prices may be volatile
- The oil industry's capability to respond to future price increases is unknown
- Oil demand may grow faster than expected
- The Iran-Iraq war is unpredictable
- Substitutes for oil may grow faster or slower than expected

MANY UNCERTAINTIES COULD ALTER OUR ENERGY FUTURE

- Energy forecasting has proven to be a difficult task. Diverse oil and energy market scenarios are possible and have different implications for future oil prices, U.S. oil imports, free-world dependence on oil from OPEC, and energy security. Some of the key unknowns that may cause our actual energy future to be different than our projections include:

  —**Oil Prices.** The behavior of prices is very difficult to predict. Over the near term, if OPEC production restraint breaks down, prices could plummet below the $10-per-barrel level at least temporarily. In any event, prices could potentially be very volatile over the next few years. Price volatility will make it very difficult for the private sector, especially the oil industry, to secure financing. Although it is impossible to quantify the impact that potential price volatility will have, in practice investment decisions probably will be made on the basis of a price lower than the prevailing average market price.

  —**Oil Industry Rebound Capability.** After the price shocks of the 1970's, the oil industry grew very rapidly. This rapid expansion produced inflation in the oil industry's costs and caused inefficiency. The willingness of the industry to invest and of the banks to provide capital was based largely on the assumption that prices would trend upward. The 1986 price collapse has proven that assumption wrong. Whether and how the industry will respond to higher prices in the 1990's is highly uncertain.

  —**Oil Demand.** A critical uncertainty for the oil market is the response of oil demand to lower prices. Our analysis assumed that oil demand increases, but not dramatically, in response to lower oil prices. If oil demand were to increase rapidly, then oil imports would increase and sustained low oil prices would be less likely.

  —**Iran-Iraq War.** Another complicating factor is the ongoing Iran-Iraq war. The war still has the potential to disrupt oil flows from the Persian Gulf. If an end to the war should lead to higher production from the region, OPEC might face difficulty in deciding how to apportion that production. Alternatively, an end to the war could create conditions under which OPEC would be able to limit output more effectively. Depending upon how the war ends, the entire region could become more or less stable and subject to potential supply disruptions.

  —**Substitutes for Oil.** Greater use of oil substitutes than has been assumed would reduce oil demand. For example, this study assumes that virtually no practical replacements for oil-based fuels will make a dent in the transportation market over the next 10 years, and that the use of oil will increase marginally in the electric power sector during the 1990's, when the rate of completion of new nuclear and coal-fired powerplants is expected to slow. Both assumptions seem sound, but both could turn out to be wrong.

- Government regulation cannot eliminate uncertainty. A market approach offers the flexibitly to deal with rapidly changing conditions

WE MUST CONTINUE TO MONITOR THE SITUATION

We Must Continue to Monitor the Situation

President Reagan has stated:

"I am instructing the Secretary of Energy to provide . . . periodic assessments of our energy security risks. It may be necessary to consider a variety of options . . . if our U.S. industry continues to be diminished and national security risks increase. I will consider further actions as warranted."

We Must Continue to Monitor the Situation

- Because of the uncertainties that confront energy markets, we must continue to monitor the situation. We believe the program summarized here is adequate to deal with the problems we are confronting based on the trends that emerged during 1986.

- Due to the complexity of domestic and international energy markets, no single indicator provides an adequate measure of the Nation's energy security. Rather, many indicators must be monitored to determine if the situation is improving or deteriorating and whether additional policy measures are required.

- While oil imports are a good indicator, the U.S. energy security situation really depends on several other indicators, which, taken together, could imply that conditions are much better or worse than oil imports alone indicate. For completeness, a comprehensive set of energy indicators is required, together with a system of periodic updating of the indicators. We will continue to monitor the following indicators:

  —**World Oil Market Indicators.**
  - Oil prices.
  - OPEC/Persian Gulf share of free-world oil production.
  - Amount of unutilized oil and gas productive capacity, inside and outside of OPEC and the Persian Gulf.
  - Level of free-world exploration activity (including geological and seismic activity, leasing awards, drilling activity, and so forth).
  - Diversity of global supplies.

  —**U.S. Oil Market Indicators.**
  - U.S. production, consumption, and import levels.
  - Sources of imports.
  - Level of exploration and development activities (including capital expenditures, geological and seismic activities, leasing awards, drilling activity, marginal well shut-ins, enhanced oil recovery activity, and research and development programs).

  —**U.S. Energy Market Indicators.**
  - Efficiency trends.
  - Conversion away from alternatives back to oil where multi-fuel-use capabilities are not retained.
  - Fuel mix trends.
  - R&D activity (especially dealing with coal utilization and renewables technologies, and advanced nuclear plant design).
  - Industrial and utility fuel-switching capabilities.

— **Emergency Preparedness Indicators.**
  - Level of government-controlled stocks in the United States and other friendly and allied countries.
  - Degree of international coordination for stock utilization.
  - Flexibility and security of oil supply systems.

— **Diplomatic Indicators**
  - Political/military threats in the Middle East or other oil-producing regions

The CHAIRMAN. Thank you very much, Secretary Martin. You have outlined the problem very well.

By the way, were my figures correct? Have we reached the 1990 target?

Mr. MARTIN. May I ask Mr. Campbell to respond?

The CHAIRMAN. Yes.

Mr. CAMPBELL. Senator, I do not believe we have reached it for the 1990 case.

The CHAIRMAN. We have reached it.

Mr. CAMPBELL. No, we have not. We are at 10.538 million barrels production a day.

The CHAIRMAN. The Monthly Energy Review for January and February—my information is it averaged 10.1 and 10 million barrels a day.

Mr. CAMPBELL. Well, we have included some processing gains in that, so I think we have definitional differences. But your——

The CHAIRMAN. Natural gas, liquids. OK, thank you.

Now, Secretary Martin, you say that a $10 oil import fee would add 120,000 jobs in the oil and gas industry. First of all, we are in danger of losing that domestic industry at the rate we are going, are we not?

Mr. MARTIN. Yes, sir, we note there are many uncertainties about the rate with which we will lose the industry, but it is clearly on a downward spiral.

The CHAIRMAN. I mean whether we have reached the 1990 target or whether we have not, it is clearly at a downward spiral. And you say you want to elevate the concern because it is a national security concern. And by projecting 120,000 jobs added in the industry, I think implicitly that says that we save that domestic oil and gas industry. That is fair, isn't it?

Mr. MARTIN. I think it is fair, and I think probably it would put maybe 1,000 rigs to work.

The CHAIRMAN. Now, the thing that I disagree with is, as you say, that a $10 oil import fee would cost at least 400,000 jobs nationwide. Now, most of those in your estimate were in the chemical industry, were they not?

Mr. MARTIN. Yes, they were in the chemical industry, but our estimate did not take account of the competitiveness issue if the price of petrochemicals were higher in this country, how many more jobs we would lose as business went abroad. The 400,000 was a direct figure.

The CHAIRMAN. But it is mainly in the chemical industry.

Mr. MARTIN. It is really in all industries that rely on energy and oil.

The CHAIRMAN. Well, more effect on the chemical industry than anywhere else, wasn't it?

Mr. MARTIN. I think it is across the board. The way the number is generated is we look at what the impact is of a $10 fee across the board on the macroeconomy, and we look at what happens to GNP and what happens to inflation. And from that, we derive the total employment loss directly. So, it is broader based than just the petrochemical industry, but that would be one of the hardest hit.

The CHAIRMAN. Well, with the petrochemical industry, you did not assume a differential for imported feedstocks, did you?

Mr. MARTIN. No.

The CHAIRMAN. Because Senator Bentsen and I have a bill in with a $2.50 differential for imported chemical feedstocks, principally petroleum based. And I think that obviates most of the problem in the domestic chemical industry.

Now, how did you estimate with 400,000 jobs leaving aside the chemical industry?

Mr. MARTIN. Well, we ran a macroeconomic model—I believe with DRI and Wharton—and we estimated what the impact of a $10 fee would be as far as raising costs to American business and American consumers across the board. Through that we estimated that the GNP would be reduced, and inflation would be increased.

One of the things that we have tried to do in this analysis is to be very specific about it in the appendix to our Energy Security report by making our methodology clear, our assumptions clear, and our results clear.

The CHAIRMAN. Now, in the budget resolution passed by the Senate, we provide for $18.5 billion. If we raise that through an excise tax, would we expect a similar but proportionately larger diminution in the GNP?

Mr. MARTIN. We show that with the gasoline tax as well you do reduce GNP, and you have an effect.

The CHAIRMAN. Any tax would have essentially the same economic effect?

Mr. MARTIN. Well, they have different effects. Yes. Various taxes have various effects. And whether it is the gasoline tax, oil import fee——

Senator FORD. Cigarettes and distilled spirits.

Mr. MARTIN. A tax is a tax. My people tell me an oil import fee is more inflationary.

The CHAIRMAN. An oil import fee you say is more inflationary.

Mr. MARTIN. Is more inflationary.

The CHAIRMAN. Well, according to the economic model whatever you take out of that economy in terms of taxes or increased prices would have a similar effect, would it not?

Mr. MARTIN. A tax is a tax. It would affect GNP.

The CHAIRMAN. Well, do you have in your model what the effect of deficits is?

Mr. MARTIN. No, in fact, that is——

The CHAIRMAN. Is that going to be solved by increased revenues that come in through the Lamfer curve?

Mr. MARTIN. As you know, we prefer to deal with the deficit through cutting spending and not increasing taxes.

Mr. Chairman, one historical fact we do know is that in 1979 the price went up $10 in a matter of months, and the OECD was put into the worst recession we have had since the World War II. So, we do know that oil is pervasive, and we have had the experience of an increase of $10 or $15, and we have seen the economic consequences. So, that level of impact is serious.

The CHAIRMAN. Did you assay the effect of the fact that oil jobs in the oil and gas industry create other jobs—we estimate between 4 to 7 jobs depending upon the locale. Did you figure that into your model? I am advised that you used 1.2 instead of 4 to 7.

Mr. MARTIN. Well, again, where do you draw the system boundary around your analysis? For every job lost in the consuming sector, we also might have a multiplier effect too. Our analysis shows that for every job you created in the oil industry, you might lose three elsewhere. And those were based on a level playing field. So, I buy your fact that the economies of the oil states would be improved, but there are losers. And one of the principles that we followed was that we needed to achieve energy security, but we had to do it at least cost to the Nation as a whole. That is what drove some of us to think about are there other measures which might produce activity in the oil fields without the macroeconomic consequences.

The CHAIRMAN. And what is that?

Mr. MARTIN. Well, the Energy Security report looks at a variety of tax measures, for example, which increase the level of activity, an oil import fee——

The CHAIRMAN. And 27½ percent depletion allowance?

Mr. MARTIN. We looked at that, and we also looked at——

The CHAIRMAN. Well, I can tell you I am for that, but anybody who thinks you can pass that is not looking at the same Congress I am looking at. That would be, I think, an idle thing to even consider proposing even though we would be for it.

Well, the problem is, as I say, you define the problem very well, but there are just no solutions. And I think the analysis of the oil import fee is faulty to say the least.

Senator Hatfield.

Senator HATFIELD. Thank you very much, Mr. Chairman.

Mr. Secretary, it is a pleasure to welcome you to our committee today.

Mr. Secretary, I want to say that the Senator from Louisiana, Mr. Johnston, and the Senator from Oklahoma, Mr. Nickles, refer to the fact that they are from oil producing states, and I certainly want to assure them that even though I am not from such a state, this problem is as great to those of us from the Northwest as it is to those in the oil producing states because we are talking about basically the security of the Nation.

I have a number of questions, and Mr. Chairman, I would like to submit some for the record instead of pursuing them all here at this time. But I would like to go into——

Senator FORD. Mr. Secretary, if you would respond in a timely manner. It has been months since we have gotten answers from various departments, and if we are to submit questions to you in writing, can we expect a timely answer?

Mr. MARTIN. Yes, sir.

Senator FORD. What is timely in your mind?

Mr. MARTIN. Oh, a week.

Senator FORD. A week? Fine, thank you, Senator.

Senator HATFIELD. Mr. Secretary, the first five months of 1986 we have information that we lost 44,000 jobs in the domestic oil industry. In that same first five months of 1986, we lost 35,000 jobs in the solar energy field.

Now, a job is a job, and the oil industry will have certainly kept you much aware of that I am sure. But there is a less effective lobby perhaps because there is a smaller lobby in these areas we

refer to as alternative sources or renewable sources. And I would like to touch on that part of it for just a few moments.

What is the administration doing—well, first of all, as you know, we lost our tax incentives in the area of solar energy, the solar tax credit. Now, what is the administration doing to help the domestic solar industry and/or broaden other renewable source programs?

Mr. MARTIN. Well, Senator, as you know, we do have high risk R&D. It is less than it used to be, but that is partly because we face a budget constraint across the board.

Senator HATFIELD. Disproportionately less perhaps.

Mr. MARTIN. It is less than it was.

In the report we note that it is very important that we have some concept for where we go after the 1990s. In other words, if we are opening up ANWR, if we are providing some incentive to the oil industry where we are most vulnerable at the moment, we had better have a good concept of what comes later. And there I share your concern about renewables.

I think the report also shows that a lot of progress has been made in improving the technology, and a lot of cost breakthroughs have been made. But let's face the fact. When you said that jobs had been lost, $15, $12 oil does not help renewables from the economic sense either.

I think that the technology has advanced to such a point that, indeed, when the price becomes attractive again those businesses will go back into business. But I do not think we have any direct idea about helping that particular industry at this time. There are no specific proposals.

Senator HATFIELD. Mr. Martin, I may not be reading you completely correct, but when you speak about the concept of where we go beyond 1990 in the context of renewable sources and alternate sources of energy which I also linked obviously with conservation programs because it becomes part of the same package.

Let me refer to page 29 of your report, if I could, because on page 29 you have already established a fundamental base that is a track record. You say on that page that "energy use is about 29 quads less today than it would have been had we not developed more energy efficient vehicles, buildings and equipment." And yet, I do not see anything in this report or in the administration's program that would sustain these gains that you say have been accomplished over the past few years, let alone improve or increase those gains.

Would you care to comment what is taken—what steps or what policies—in the area of conservation and fuel efficiency gains to sustain that particular record?

Mr. MARTIN. Well, first I think the record will continue to be sustained just because of the turnover of capital stock. That was what I referred to earlier. We know today that we are replacing a car from 1977. Next year we will replace a car from 1978. So, over time there will be efficiency improvements because technology today, whether it is an auto, a home or industrial process, is more energy efficient. So, indeed, we think that the turnover and the move towards more efficiency will continue—because it makes good business to those people who want to compete in a tough market today. So, we think the market——

Senator HATFIELD. Mr. Martin, where is the momentum coming from that is going to sustain this R&D or technology? In this particular year we have $2.5 billion for clean coal, and I support that. But we have for all of the renewables $89 million. Now, $89 million is rather a pittance when you look at the scope out there of possibilities. So, I don't understand how you say we are going to sustain a momentum here that has been started back when we had solar tax credits, which we do not have now, when we had far larger budgets, tripled, quadrupled, quintupled budgets on R&D? Where is that momentum? What is going to generate the momentum? What is the fuel of the momentum?

Mr. MARTIN. Well, the fuel is that when people trade in their car or buy a new house or commit to a new process for making steel, it will be a more efficient one. So, what we are seeing is a tremendous amount of users, millions in fact, in the marketplace making better choices for themselves.

I agree with you. The R&D is very important for the government to continue. But $89 million does not sound like pittance to me. That is still a lot of money.

Senator HATFIELD. Certainly it is a lot of money, but when I look at the supplemental that has $131 million just for another little step in SDI, or when I look at the amount of research going in to how to destroy life with greater efficiency, I am not very impressed with the figures of $89 million. That is the petty—well, that does not even buy the erasers and the paper clips for the programs of R&D in the military.

Mr. MARTIN. I hate to comment on the defense budget.

Senator HATFIELD. I know, but this is a defense matter.

Mr. MARTIN. I do think that we——

Senator FORD. Oh, have at it. We would like to hear it. Go right ahead. [Laughter.]

Mr. MARTIN. We need to use that money efficiently.

Let me also say, Senator Hatfield, that we have initiated a study of alternative fuels. It is very clear that oil use is concentrated in the transport sector, and yet at the moment we are still hooked on gasoline. Over the longer term, post-1995, 2000, we will ultimately need to move more towards alternative fuels. And we will be looking at that pretty hard. And I will probably have some better answers for you on that score when we finish the study.

Senator HATFIELD. All right. I am not going to press you further on that, but let me just make one final comment and question.

Is it not true that today we are importing about 6 million barrels a day or a little less perhaps of oil from these dangerous parts of the world, the Persian Gulf?

Mr. MARTIN. The United States imports around a million barrels from this region—from the Persian Gulf.

Senator HATFIELD. Persian Gulf.

Mr. MARTIN. The Europeans and Japanese import much more.

Senator HATFIELD. I understand, but I am saying the United States at this point. About 6 million. Would that be about——

Mr. MARTIN. No. We import about a million. Let me just tell you——

Senator HATFIELD. That's total?

Mr. MARTIN. 870,000 barrels per day from Saudi Arabia.

Senator HATFIELD. Then the total import is about 6 million.

Mr. MARTIN. Yes, the total import level

Senator HATFIELD. The total import, all right.

Mr. MARTIN. Five to six. But most of our oil comes from Venezuela, Canada, and Mexico. But we have increased over the last year our imports from Saudi Arabia, which were even lower than I said before.

Senator HATFIELD. All right, then that's the total. That makes a better point than I am aiming at anyway.

All right, now on page 94 of your report you say in effect that it is estimated that this country could save the equivalent of 5 million to 12 million barrels of oil per day by the end of the next decade if "existing cost effective technologies and those anticipated from future R&D are applied fully to improve energy efficiency. 'Is that a correct reading statement?

Mr. MARTIN. Yes, sir. And I think it underscores again the importance of conservation.

Senator HATFIELD. In other words, it is conceivable that the United States could be energy independent by the year 2000——

Mr. MARTIN. No. I think that means——

Senator HATFIELD [continuing]. Based upon current levels——

Mr. MARTIN. I think we have assumed these numbers in our estimates, and we still show a vulnerable situation. So, as I say, we assume a lot of conservation, and we still get to those import levels.

Senator HATFIELD. I understand there are some qualifications to that. But the point is simply are you satisfied that the current budget will produce that R&D level to achieve that energy independence goal in Fiscal Year 1988?

Mr. MARTIN. Yes, sir. And as I say, the reason I am confident is that we will basically achieve those savings with existing technologies infiltrating the market in the next 10 years. I think the newer technologies will not have an impact on the market till a post-2000 period.

Senator HATFIELD. I'm sure.

Senator EVANS. I wonder if the Senator would yield just for a minute on this point. Just if I might interrupt to clarify something because I think you hit a very important point. You indicated that you had included certain deficiencies in your base piece, but at least the statement that the Senator from Oregon read said between 10 and 25 quads of energy. That is a fair number of millions of barrels of oil between 10 and 25 quads. Which is it? What have you put into the forecast? How much energy efficiency? Is it 10? Is it 25?

Mr. MARTIN. It depends. These probably depend on our two price paths. In the higher priced case you would see greater achievement of conservation. In the lower priced case you would see less. And as I say, the whole study was based on two projections of the future to provide the glimpse of a range.

Senator EVANS. Perhaps you for the record ought to tell us more precisely how much you have in your forecast for energy conservation.

Mr. MARTIN. I would be glad to submit that for the record, Mr. Chairman.

[The information follows:]

The estimate of 10 to 25 quads of energy conservation savings by the year 2010 comes from an in-progress review of six "conservation potential" studies. These range from studies made in the late 1970s, to a more recent analysis by the National Audobon Society and a 1985 estimate by the DOE Office of Conservation and Renewable Energy.

The wide range in these estimates is due partly to different assumptions about "basecases", energy prices, and market acceptance of new technology, as well as differences in methodology.

DOE's Office of Policy, Planning and Analysis has work underway to narrow this range by normalizing data and adjusting to a more common basecase in order to account for other differences such as economic growth. When this work is done we expect a narrower and more reliable range of future conservation potentials.

The EIA Annual Energy Outlook estimate of energy demand for the year 2000 is about 87 quads, which assumes continuing efficiency improvements from both stock turnover and increasing efficiency of new stock, such as cars and appliances. Twelve quads of energy savings are assumed from increasing efficiency due to new technology. Stock turnover adds another 8 quads to these savings from what would otherwise be the case if no decrease in energy use intensity took place (compared to 1985 levels).

The 10 to 25 quad estimate (on page 94) represents <u>all</u> forms of energy, not just oil. The accompanying reference to equivalency in barrels of oil was presented only to aid the reader, not to imply this is all <u>oil</u> savings. In fact, given how oil is used in the economy, we would expect substantially less than half of these savings to be oil.

Senator HATFIELD. Mr. Martin, I would urge you to give the Secretary a strong message at least from this member of the committee that those of us who are deeply concerned and committed to questions and issues of environment and conservation find it very difficult to listen attentively to proposals by the Secretary of the Interior and other members of this administration in the name of national security, in the name of national need, to open the arctic wildlife refuge for exploration and drilling and for sensitive areas off the cost of California when we do not see very much evidence that we are pursuing any kind of parallel program to develop energy alternatives, especially in the renewables, and in the field of conservation because some of us believe that conservation is equivalent to a new source of energy.

And so, I think there is a linkage here, and we cannot speak about the needs of national security on the one hand without pursuing that on a broader base than what is perceived by me at least, based on this report, and especially when in this report there are assumptions made that we are going to have certain R&D and certain technologies achieved by a certain date in the future when, frankly, going back to the appropriation and the budget request, the level of funding in my view will never achieve those assumptions.

Senator FORD. Senator Nickles.

Senator NICKLES. Thank you, Mr. Chairman.

Mr. Martin, you had a chart up originally which, I know that you are aware, I have been critical of. Could you put the chart up so I could look at it? It is the first chart that shows the amount of imports.

Currently, as Senator Hatfield alluded to, we are importing today 6.1 million barrels per day. Now, that is gross imports, not net imports. But I personally think you should use gross imports because we have commitments to territories. That is where a lot of that goes. Some of it goes to bunker fuel or whatever. But anyway, those are commitments. That is what we are paying for. And I think even in a shortage situation, we are still going to be meeting those commitments to the territories. So for one, I think you should be using gross imports instead of net.

So that puts us at the fact that we are already importing 6.1 million barrels per day. Our domestic production has fallen off much more rapidly than what your chart shows. Our imports are already higher. This is only in the middle of 1987. You just mentioned in your opening statement that you thought under a low-price scenario that we will be at 50 percent by the year 1992. I have tried to convince you and other people in the administration that in all likelihood we are going to be at 50 percent by the year 1990.

Do you agree with that statement?

Mr. MARTIN. Well, if you use your indicator of gross, we are at 50 percent in 1990. And if you use net, you're at 50 percent in 1992. So, by your definition we agree that the problem is in 1990.

Senator NICKLES. Well, let me ask you a question. Do you feel like we will be meeting the amount that we export to territories and so on even if there is a shortage situation; won't we fulfill those commitments to our territories? Won't we be supplying that oil to them? Won't we be selling bunker fuel and petroleum coke?

We can't really use that source of fuel domestically in many cases. That is the lower end of the refining process, so you basically have to sell it.

And so basically, we are going to be writing checks for that 6.1 or whatnot. Those commitments are still going to be there. So, really shouldn't gross imports be the figure that we would be using?

Mr. MARTIN. Well, I think we can say it either way and just say what it is we mean so that we are statistically correct when we talk with one another.

Senator NICKLES. Well, I would hope so, and I would also hope that there would be some realization that that figure widens in both ways. In other words, as domestic declines, you show a very gradual reduction in domestic production through the year 1995. I wish that you were going to be correct. I don't think you will be.

I think if you showed the actual loss of production, which you mentioned in your statement, we lost 750,000 or 800,000 barrels domestically. In my state it was 22 percent last year in 12 months. That's a dramatic reduction equally offset by an increase in imports. You show that under either the high or low-price scenario was fairly stable domestic production. I think you are being overly optimistic on what U.S. oil production will be under present policies. I think that line will decline at a far more rapid pace than what you are estimating. I wish it was not the case. I hope that you are proven right. But I don't think you will be. We do not have the rigs running.

You know, when you look at that bottom blue line and you show it fairly level, you might remember that between 1978 and 1985 you had an average of over 3,000 rigs running. Today you have 700 and some running. So, you do not have near the number of rigs running to maintain level production. You only have 700 and some rigs running. A few years ago we had more than that in my state alone.

We have some question. You know that Prudhoe Bay is going to be declining. And some question of whether or not we are going to have ANWR on to replace that. I hope that we do. Our country desperately needs it, but I am not sure that we will.

You also have a serious, significant reduction in your existing reservoirs, as many of those are being depleted and many are non-economical so they are being shut in prematurely. So, you add all those factors together, and I am afraid that you are very optimistic on what our domestic oil production will be. And as that figure goes down—and I think it will—you are going to see that green figure rise and rise substantially. And so, instead of being at 50 percent by 1992 and using gross, you will be there at 1990. In 1995, to take that a little bit further, instead of being 60 percent, you are probably going to be in excess of two-thirds.

And that is really a scary scenario that, if nothing else, we ought to wake people up to the fact that you look back to the previous shortages. We had the shortage in 1973. We were importing less percentage-wise in 1973 than what we are today, and the economic consequences that happened when we had that shortfall. And then in 1979, the percentage was a little bit higher, but we are going to race through that figure in 1979. We are importing 44 percent in

1979. We will be through that figure probably—my guess is we will be through that figure in 1988 or 1989.

And so, I think your scenario shows a very serious problem. But I actually think the problem is more serious than what you are showing. And then what are we going to do about it?

From the proposals that I have seen, do you think the DOE's or the President's proposals are adequate to meet the threat or the fact or just the fact that we are going to be importing that large of a percentage? And you may be correct in saying we are not importing that much today from the Middle East, but would you agree with me that almost all of that increase in imports will be coming from the Middle East countries?

Mr. MARTIN. Yes, I would agree with that because we have about 10 million barrels a day surplus around the world, but two-thirds of that is in the Persian Gulf. And many of the other producers, whether they are Canada, Mexico, North Sea, are facing a stable situation or going down slightly as we are. So, clearly, incremental production will have to come from OPEC and particularly the Persian Gulf.

Senator, on page 29 we do try to specify what OPEC production would be under both a high and low price care. Later, we also looks at both the lower 48 and Alaska but I think this sort of masks the difference. But in both cases we do show declines. And I feel that is a serious situation.

One of the issues is the recent pickup in the oil price. To what extent is that going to help? The Petroleum Intelligence Weekly, for example, this week estimates there might be 1,300 rigs at work by the end of the year. Then again——

Senator NICKLES. Let me ask you a question. With $18 oil, somebody is predicting 1,300 rigs?

Mr. MARTIN. Yes, the Petroleum Intelligence Weekly by the end of the year.

Senator NICKLES. Do you endorse that? I would be glad to hear it.

Mr. MARTIN. I feel there is still uncertainty about the stability of that price at that level because I think it can also go down. At the moment we just note for the record that we tend to be on the higher priced trajectory of the study. But again, that is with great uncertainty. I can see a situation where we would slip down again. And it really, once again, depends on the Saudis, what they want to do as swing producer.

Senator NICKLES. Well, let me ask you. Again, back to my question. The President came up with some recommendations, most all of which I would support. But I do not think the President's recommendations do near enough to really say we are going to be in good shape by the year "x." Whether it happens in 1990 or it happens in 1993, President Reagan is going to be gone. You may or not be gone. I don't know. But some of us are still going to be here, and I am wondering. Do you think these recommendations are going to be enough to forestall a very serious problem?

Mr. MARTIN. I think they are a start. I think we have been discouraged that even the proposals we have got on table, like repeal of the windfall profits tax or comprehensive natural gas reform, have really not been able to move in the Congress itself. So, even

the relatively minor issues we think that would have relative acceptance to just about everybody are not going through.

So, I think we say that this is the beginning of the slate. The President says in his last paragraph that it may be necessary to consider further action if our U.S. industry continues to be diminished and national security risks increase. So, we have a beginning agenda. Certainly from the Department of Energy perspective, I do not think it is any secret that we asked for a little bit more from an energy security perspective when we went to the President about this situation.

Let me also say, however, there were other issues the President had to weigh such as the fact we went through tax reform last year, we have the budget to respect, and we have environmental concerns. So, that is why at least we got it up to cabinet level, and we had an active debate from the various different priorities which we all share. As a result, the President came out with this letter. So, I think it was a fair process, and I think where we are is pretty good.

Senator NICKLES. Again, I will just say that I think it leaves a lot to be desired. And the problem probably will not happen on your watch, but I have got a feeling it will happen in the not too distant future. When we are importing 50, 60 percent, I think we are very vulnerable.

When you did the price analysis—first thing I am going to touch on imports and import fee. I have always been irritated when I hear you do an economic analysis of a $5 fee or a $10 fee because for those of us that have been trying to do something, with the exception of Gary Hart, nobody was pushing a $10 fee, and I am not sure that anybody was pushing a $5 fee. Most of us were talking about some type of a floor price, $18 or $20, which would have minimal economic impact if adverse in any way, shape or form. But I see a terse one or two paragraphs on it, and then it is kind of glossed over, and then they move on. I fail to see that its impact was considered.

And then I also fail to see that the impact of a curtailment, a shutoff imports of oil, or a significant portion of imports. It says a disruption is assumed to occur in 1995. Well, what about a disruption occurring in 1991 when we are importing 53 percent or something like that? What kind of economic negatives are involved in that similar to the shutoff that we had in 1973 or 1979? You didn't take that into consideration in your report. You assumed—and I guess you have to assume something somewhere, but you picked 1995, and then you are weighing that versus a $5 fee and a $10 fee. And I think the Senator from New Mexico and many of us have been talking about a floor price of $20 or something.

Senator DOMENICI. We could even put a cost-of-living add-on, if you can, make it as fat as possible. I didn't hear anybody put a CPI on any one of these. That's in this one.

Senator NICKLES. In other words, I am being critical of your analysis because when you paint a brush and say we are opposed to an import fee, people up here were not pushing a $10 fee or a $5 fee. We were talking about floor, and it looks like a very negative construction was designed by this analysis biased against it.

Mr. MARTIN. Senator, let me say that we took a $10 fee because that was the level at the time we felt—at least many were telling us—would be needed to bring on the added production and lessening of demand in significant enough quantities to make a difference. Now, the $10 fee reduces imports into the Nation by roughly 1 and a half million barrels a day by 1995, roughly half and half, half demand reduction and half increased production. I think it is a little bit more in terms of demand than production. That is how much less you buy as far as imports. We thought it was important to get that magnitude right.

We took 1995 because that is one of the times we think we are most vulnerable. That is when we have 10 million barrels a day of oil imports. That is when the world is 60 percent dependent on OPEC. That is the worst scenario we can construct.

In that scenario we say how much do you benefit by having the oil import fee in that situation? And what we find is you do have macroeconomic benefits by importing a million and a half barrels a day less.

Senator NICKLES. Mr. Martin, nobody was talking about $10.

Mr. MARTIN. Well, OK.

Senator NICKLES. What about the $20 scenario.

Mr. MARTIN. OK, Senator, but you tell me—and I am willing to listen to anybody's analysis. You don't get much added production if you just put on $5. You certainly don't get much additional production if you have a floor. You might get a little bit, but you don't get that much.

People have argued that the oil import fee is the answer to energy security; I am here to tell you it is not. There are not any spectacular things we can do——

Senator NICKLES. Mr. Martin.

Mr. MARTIN [continuing]. That is going to diminish that much beyond what it is, Senator.

Senator NICKLES. I will give it back to you, Mr. Chairman. I just want to make a couple——

Senator FORD. I am enjoying this. Go right ahead. You are all on the same side. Remember that.

Mr. MARTIN. But I would like to address the floor.

Senator NICKLES. I want to come back to the price floor because again, no one up here was pushing the $10. So you paint this big brush, the new oil import fee is that negative. I voted against the $10 import fee. I do not think that that is the right way to go. It would make a lot of industries very non-competitive.

The floor, on the other hand, at $18 or $20 would give some stability that currently is not there. We had oil prices drop to as low as $9 last year. And a lot of people remember that.

Senator FORD. And we stopped buying oil for SPR at that point.

Senator NICKLES. Yes. We quit buying when the price of oil was that cheap. That is correct.

Senator FORD. See, Daddy brought me up buy low, sell high.

Senator NICKLES. So, it just seems to me that there was very little consideration given of a floor price in that type of a category which would lend some stability and would allow investors or whoever to try and think that we might try and produce that because when you were looking last year at average prices of what? Prob-

ably in the $13, $14 dollar range. You know, if we had that $18, it might have made the difference of not prematurely abandoning a lot of wells.

Again, I just didn't see very much work done in that. You also used a 10-percent discount instead of 7. You picked 1995 which is way out there. I hope we do not have a disruption until the year 1995, but we are very vulnerable to it well before that time. I think you skewed it so much against the floor that you had your case already made before you really did your study.

Mr. MARTIN. I would like to ask Mr. Campbell to address the floor price issue. May I, Mr. Chairman?

Senator FORD. Absolutely. But you have a lot of people up here that agree with Senator Nickles' last statement. We think you had your mind made up, and then you went and made the study to substantiate what you had your mind made up on. Now, if he can convince me otherwise——

Mr. MARTIN. Well, Mr. Chairman, may I just address that.

Senator FORD. Well, don't undress it.

Mr. MARTIN. We wanted, I might add, to be very clear, again, what our methodology was, what our results and our assumptions were, so that anybody could tear them apart and say that we are dead wrong. I have not seen any analysis at the moment that says our analysis on an oil import fee is not correct. I have also encouraged other people who believe so deeply in a floor or an oil import fee to come up with their numbers and tell us how they see this issue so that we can compare our methodologies. I knew we would be accused of trying to come up with a pre-conceived answer, and that is why we were so open about our methodology.

But with the exception of one guy up at Harvard University who seems to think a $10 oil import fee is in the interest of the country and has shown us his analysis—and we are working to see what the differences are—I have not heard from anybody.

Senator NICKLES. Well, you are hearing from some right now.

Senator FORD. Yes, I think so, those that count.

Mr. MARTIN. I would like to see the numbers.

Mr. CAMPBELL. If I might just comment briefly on the floor.

On the oil import fees, these are $10 and $5 variable fee cases, points of reference. And the losses, the cost, the advantages are all proportional. And you can just run it on down and see where it takes you, and then balance that against the security gains you get for it.

As for a floor, we looked at a floor, too. A floor is a little bit different because the idea of a floor, as you come in and say $18, you come in under the current price. It is a good insurance policy. It encourages capital formation. It doesn't move price very much, but it does put a floor on prices. What it does is shift the risk of lower oil prices from the oil producers to the oil consumers. And so, as a policy decision, Congress has to decide whether they want the oil people, the oil producers, to carry that risk or whether they want the consumers to carry the risk, because if the price falls, then somebody is going to have to pay.

And another problem we had with it was, that when you set a floor, you reduce the down-side for the oil producer, for the oil producing states. But we think that jeopardizes the repeal of the wind-

fall profits tax because if you are going to go into business and the government is going to remove the down-side risk, how can that same industry ask you to remove the up-side? So, there are some problems with the floor concept. What it does is it improves the borrowing base calculation that banks supply to oil and gas loans, and I think it does 20 to 23 percent improvement. So, it would improve some liquidity. It would improve the banking situation because it would improve their loan loss reserve category, maybe take 20 or 30 percent out of that from their energy portfolio.

What it does not do, though, is stimulate a tremendous amount of drilling in this country which is where you get your security gain. It could be helpful, but the administration and Congress have to make a decision whether they want to shift that risk.

Senator NICKLES. You mentioned it would not stimulate a lot of drilling, but in my state I mentioned we had a 22 percent reduction in production. That was not just because we pulled up the drilling rigs. A lot of it is because a lot of them were shut in prematurely. That is oil that is lost. Yes; it may hurt my state, but it is going to hurt the country. That is oil that will be left in the ground forever, and that is oil that we will be buying and pay probably a much, much higher price than $18 or $20 in the not too immediate future.

And one final comment—and I know the Chairman wants to take the——

Senator FORD. I just want to give other Senators a chance.

Senator NICKLES. And I understand, and I will be happy to yield.

But you are assuming that we have a free market at work and you don't.

Mr. CAMPBELL. No, no.

Senator NICKLES. You have OPEC countries that are manipulating the price, driving it down. If you had a purely free market, you could make that argument.

Mr. CAMPBELL. There is no free market. And I agree the loss of stripper production is a national tragedy and we ought to see what we can do.

The problem is price.

Senator NICKLES. But you didn't do anything about it is what I am saying.

Mr. CAMPBELL. It is the price that will save the stripper production, the floor price at $18 is not going to—you could have $23 or $25 a barrel of oil——

Senator NICKLES. You could save a whole lot of stripper production at $18.

Mr. CAMPBELL. I think you could save some.

Senator NICKLES. Well, but you didn't do anything to save it is what I am saying.

Mr. CAMPBELL. Well, now, the transfer rule we have recommended will save——

Senator NICKLES. The transfer rule will help.

Mr. CAMPBELL. Income limitation, 100 percent will help. Both those will help, and we figure we will save almost 100,000 barrels a day in stripper production.

Senator NICKLES. Thank you, Mr. Chairman.

Senator FORD. Senator Bingaman.

Senator BINGAMAN. Thank you, Mr. Chairman.

Let me ask about a bill that I introduced called the Energy Preservation Act of 1987. This is S. 751, and I have a section in there that would essentially direct the Secretary of Energy to urge the International Energy Agency to raise the minimum sales price for crude oil. I gather in 1976 they set a minimum sales price of about $7. I am suggesting that it should go to $20, and that the Secretary of Energy should recommend that to the I&A Ministers.

Before Secretary Herrington went over to Paris for this recent meeting Senator Johnston and I wrote him a letter requesting that he raise this issue of the minimum sales price. We saw this as a way to get away from the problem of our country's industry being non-competitive with foreign industry.

We have not received any response to our letter. I wondered if you know whether the Secretary of Energy raised the issue and whether the Secretary or the administration agrees or disagrees with this idea. Is this something that in your view merits serious consideration?

Mr. MARTIN. Senator, I do recall seeing your letter. I think the Secretary of Energy will have to answer the question whether he raised it because I was not in Paris. But I am familiar with the minimum safeguard price. It was negotiated in 1977. I believe $7 was the price set. It is a very contentious issue. At the time it was Kissinger who felt pushing for this was important because that was the price at which all alternatives would be protected. If it went below $7, we would face real problems. Well, that shows you how imprecise the knowledge of government can be. If you adjust that for inflation—and we have looked at this issue—you get up to about $11 or $12.

Let me say that while it is an interesting concept, the administration has not endorsed reopening the minimum safeguard price, and we have found absolutely no interest on the part of other nations in reopening the MSP debate. But I will have to check with Secretary Herrington to see if this came up at the ministerial meeting.

Senator BINGAMAN. But you have explored this with other nations?

Mr. MARTIN. It came up I believe about a year ago in a governing board meeting by the Germans. I would have to check whether or not there was interest.

Senator BINGAMAN. Do you know if it has come up since?

Mr. MARTIN. I don't believe it has. It was certainly not part of the preparations for the IEA ministerial. It was not debated in the communique. And it did not arise. It just came up very briefly I think about a year ago. But we have not endorsed this idea, Senator.

[The information follows:]

JEFF BINGAMAN
NEW MEXICO

United States Senate

WASHINGTON, DC 20510

May 8, 1987

The Honorable John Herrington
Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Mr. Secretary:

We write with regard to your upcoming trip to Paris for the Ministerial meeting of the International Energy Agency (IEA) Governing Board. The Energy Preservation Act, S. 751, was introduced earlier this year by Senator Bingaman to provide a strategy for helping to preserve our domestic oil and gas industry. Section 6 of this legislation requires the Secretary of Energy to take action necessary to cause the Governing Board to update its 1976 agreement pertaining to oil imports. The 1976 agreement established a $7 per barrel Minimum Safeguard Price (MSP) for oil imports. This action commits IEA members to take whatever steps are needed to ensure that oil would not be sold in their domestic market at a price less than the MSP. The legislation set the new MSP at $20.

We encourage you to pursue this issue with the other members of the Governing Board. Such a decision would help ensure that any steps to preserve our energy security would be taken multi-laterally. We think this approach is preferable to a unilateral action by the United States.

The result of IEA adopting a new and higher MSP would be a stabilizing of crude oil prices -- an essential factor for ensuring energy security.

We look forward to your response.

Sincerely,

J. Bennett Johnston
United States Senator

Jeff Bingaman
United States Senator

THE SECRETARY OF ENERGY
WASHINGTON D C

June 8, 1987

Dear Senator Bingaman:

Thank you for your letter of May 8, 1987, concerning establishment of a minimum safeguard price (MSP) for oil imports. While I agree that a cooperative international approach enhancing energy security has benefits, I believe that the current Administration program of removing impediments to domestic and other non-OPEC oil and gas production and encouraging stock building by our partners in the International Energy Agency is an appropriate approach at this time.

As the President stated in his letter to Congress, additional measures may be warranted if our U.S. oil and gas industry continues to be diminished and national security risks increase. If and when additional actions are considered, we will pursue those actions which are most cost-effective and which enhance international cooperation.

Attempts at price stabilization through market intervention are potentially very costly to consumers and to the economy as a whole. Given the current market situation and the President's recommendations, I do not think it appropriate to pursue the Minimum Safeguard Price before the International Energy Agency.

I appreciate your continuing interest and concern. Please contact me if I can be of further assistance.

Yours truly,

John S. Herrington

John S. Herrington

Honorable Jeff Bingaman
United States Senate
Washington, D.C. 20510

Senator BINGAMAN. I would appreciate it if you would let us know whether this is something that you think, in light of the change in the price of oil in the last year or so, justifies a reconsideration. I think I would be interested in seeing that.

Let me also ask another question. As I read your report, your report constantly refers to the fact that we want to maintain the free market in oil. And yet, the testimony just a few minutes ago was that there is no free market in oil.

I am wondering if there is any change in any of the scenarios that you project. We have 19 more months in this administration. Is there any change that you could foresee in the international oil situation that would warrant the administration taking some action other than what you have already embraced?

Mr. MARTIN. Well, I would hate to talk about hypotheticals, but the last two or three sentences in the President's letter say that further action may be warranted if national security requires it or if the industry diminishes further. And that becomes the operative language.

Senator BINGAMAN. How much further would you want the industry to diminish before some action would be warranted?

Mr. MARTIN. Well, I think it is worth noting what happens in the next few months with a slightly higher price than we were seeing a year ago at this time if, indeed, the rig count goes up. Unfortunately the rig count has gone down the last couple of weeks. It is down to 745 now from about 765.

I think we would have to look carefully at what OPEC was doing, what the Saudis were doing, where the Iran-Iraq war was going, the import level of other nations. That is one of the reasons why we want to embrace the concept of monitoring much more specifically a wide range of indicators, and improve our data base so that we will be able to evaluate those two points.

But I think one lesson is true. The oil market is a very volatile one, and the Middle East situation is a very volatile one.

Senator BINGAMAN. Do you see as one of our objectives or one of the administration's objectives stabilizing the price of oil?

Mr. MARTIN. From a government perspective, I do not think we should be in a position to say what is a good price and what is a bad price. And we have avoided that, as you know.

Senator BINGAMAN. You think that the government should stay out of the business of trying to eliminate major fluctuations in that price.

Mr. MARTIN. I do not think that is the government's responsibility.

Senator BINGAMAN. Would you agree that the major fluctuations in the price of oil are a main reason for the difficulties that the domestic oil and gas industry presently face?

Mr. MARTIN. I certainly do. And I think we even say in our testimony, our longer version, that the price could go down, or the price could go up.

Senator BINGAMAN. And you are also, as I understand it, taking the view that these major fluctuations are primarily the result of actions by the Saudis.

Mr. MARTIN. It could be a number of other factors too, but clearly they have had the biggest impact on the oil market in the last

year, depending on what their level of production was and how the OPEC quota system was working out.

Senator BINGAMAN. And you think it is better to leave our domestic industry subject to fluctuations resulting from actions by the Saudis than it is to involve our government in trying to regulate or buffer those fluctuations.

Mr. MARTIN. I do not envy those in the domestic oil industry or other energy sources that have to invest in today's climate. But I do not think it is the responsibility of government to try to stabilize price through our activities.

Senator BINGAMAN. Not even if it is a foreign government that is altering those prices rather than a market, a free market.

Mr. MARTIN. Well, I think I have answered that about six different ways, Senator. I really think that—I know what you are getting at. I just don't think that is the responsible role of the government.

Senator BINGAMAN. That is about all I have got, Mr. Chairman.

Senator FORD. Fine. Thank you.

Senator Domenici.

Senator DOMENICI. Well, Mr. Secretary, let me ask you a hypothetical question. What do you think the Secretary of Energy would have done if this study had proven that the net benefit of, say, a $5 import fee was positive?

Mr. MARTIN. Well, that is a hypothetical.

Senator DOMENICI. It sure is, but I think it is relevant. Do you have any idea? What would you have done?

Mr. MARTIN. Well, I think we laid out in the book the criteria by which we evaluated different policy options. We said that we just cannot look at energy policy in isolation. We have to evaluate whatever policy it is we assess, by what it does to the budget, what it does to the environment, what it does to the macroeconomy, what is does to the national security and military preparedness, what it does to trade so that we can ultimately assess the cost benefit of that policy to the Nation as a whole. And if the costs from our analysis were less than the benefits and it looked like a good buy for the Nation, I would hope that we would say this is something we should propose.

Senator DOMENICI. Well, let me tell you what I think, and then I am going to ask the Chairman if he will leave the record open for a while because I think we ought to accept your challenge. You have said to us that nobody has challenged this report with any technical or professional skills, and I just do not believe that it ought to go unchallenged. I think it is wrong. I think on $5 a barrel instead of $10 that it is absolutely wrong even if we use your basic dates and other things that I think could be varied in terms of any scenario, but even using them.

I frankly believe whoever put it together kept adding up factors until they got a negative because it would have been rather embarrassing in my opinion to send the President the report that said a $5 a barrel import fee has a big plus for the United States. I think there was almost a mind-set against it.

I am told, for instance, that there is real reason in traditional economics to use completely different economic modeling than you used. Let me just give you an example. Where you end up with the

welfare attributes of this $10 a barrel import fee, you come up with an impact on so-called welfare. Back later where you used $5, you come up with one also there. It is sort of down at the bottom, but nonetheless it is there. And it shows that there is a negative impact on the welfare. And you used microeconomics for that as you should, and you ought to measure that. Economists I have talked to say that is very traditional.

Then you come along and if you just used that, and then use such things as reduction in import costs, which you have done—it is a very big item on our side. Security benefits—you have attempted to calculate those. That is a big plus. Then you come along and for the second time through you use the macroeconomic effects. That is a great big negative.

Now, I am told—and I am going to ask the Chairman to let us have some economists give us their version—that you do not do that. Traditional economics would say you include that kind of thing in the welfare, but you don't count it twice. And you have.

I am told that there are a number of people that don't agree with this way of assessing the negatives. As a matter of fact, if you don't do it that way and count the negatives in the welfare end, and then don't come along with the macro again, a $5 a barrel one is positive on all fronts. From the standpoint of the impact on the economy plus, and from the standpoint clearly on treasury, you pick up revenues.

So I am going to ask for about 10 days, if the Chairman will permit us to, to see if we can ask some economists to look at that.

Senator FORD. Shoot, I'll give you 2 weeks.

Senator DOMENICI. I thank the Chairman.[1]

Senator FORD. He gets 1 week for answers and we get 2 weeks for the——

[Laughter.]

Secretary, will you ask the Secretary about Senator Bingaman's—you know, be sure. That has not been answered yet.

Mr. MARTIN. I'll be glad to.

Senator FORD. Some requests made in February have not been answered yet. So, you know, just try a little harder.

Senator DOMENICI. Let me also ask what are the effects on the deficit in this report? In one place you clearly state that we pick up revenues, and you state according to DRI and others, you pick up revenues. And then in another place you say we don't all within the framework of two pages. I do not understand which is correct.

Mr. MARTIN. Sir, I don't understand your question.

Senator DOMENICI. Appendix D of the study. Let me see if I have got this one. Yes, appendix D says detailed analysis of import fee contains a direct contradiction. In D-4 the report states: "Enactment of import fee would not reduce the Federal deficit. It might actually increase it." One page later it goes on to say: "An oil import fee of $10 a barrel would raise direct Federal revenues of $155 billion and reduce the deficit by $69 billion for a period of 1988 through 1995."

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[1] See appendix II for material submitted by Senator Domenici.

Mr. MARTIN. I think it probably depends on the case. I think the reason why in some of the cases we do not show a net benefit on the deficit is because you have a lower GNP. You reduce the revenues into the economy and, therefore, those participants pay less to the Treasury.

But I would welcome your challenge, Senator, and I would be glad to provide one of our top economists to go through this together because I think it is an important question that needs to be settled. We have put our numbers on the table. We stand by them, and we encourage others to critique them and criticize them, and then we will get our folks together and find out the answer to this.

Senator DOMENICI. What if it turns out that on $5 a barrel the estimate of negative impact on the economy is in error? What will happen to the report?

Mr. MARTIN. Well, I don't think it will.

Senator DOMENICI. You don't think it will. But I am asking if——

Mr. MARTIN. Let me tell you something else an oil import fee does. It also reduces the world price because we are importing less. It reduces the world price of oil which means other nations will conserve less and other key oil fields like in the North Sea will have less economic incentive to be developed. So, your ultimate reliance on Persian Gulf may or may not be improved that much.

These are the complicated issues you get at in this. And I would be delighted to put forward our team. We spent a lot of time on this.

Senator DOMENICI. But it also means if the world price goes down, that a portion of the import fee is paid by the supplying country instead of our consumers, right?

Mr. MARTIN. That is right because you are actually——

Senator DOMENICI. Paying less for oil.

Mr. MARTIN [continuing]. Providing—that is right.

Senator DOMENICI. So, they are paying part of the fee.

Mr. MARTIN. That is right.

Senator DOMENICI. Nothing wrong with that, is there? That is good, isn't it?

Mr. MARTIN. Well, again, the name of the game here from my perspective is security. How much do you reduce the situation of reliance on OPEC by a given policy? I think that a $5 fee does not help you that much. I do not think a $10 fee helps you that much. Again, you are a million and a half barrels a day less import dependent in a world oil market of 50 million barrels a day. So, it helps certainly, but the costs are quite significant, Senator. I think you will find that when we look at the short-term economic impacts.

Senator DOMENICI. Well, we will be glad to see if we can get somebody to look at what I think is the double counting of the macroeconomic impacts.

Mr. MARTIN. Terrific.

Senator DOMENICI. And to see if we can get them in the record.

I have one last question. With reference to some of the other recommendations that came out of your study on the tax side. They didn't all come up here in the President's letter, did they?

Mr. MARTIN. No.

Senator DOMENICI. So, what happened to those? The President decided that he didn't want to send those up? And what does that do to the overall validity of the thrust that you produced a positive document on America's dependence and to domestic industry?

Mr. MARTIN. Well, one of the values of the energy security book, again, was that we tried to quantify the impact and the cost and benefits of different policies. So, we spent a lot of time on tax issues like what would happen if the depletion allowance were 27 percent, or what would happen if you had a tax credit of 10 percent.

In many ways the book concludes that we could get the same sort of activity in the oil fields which we need and want through a tax incentive at far less cost than an oil import fee. And that is why from our perspective when we ranked these in order of priority for the President's consideration, these measures went before the import fee. Let me also say that we had extensive discussion of this subject at the cabinet level. Furthermore, there were other considerations which the President considered, including the issue of reopening tax reform and the budgetary impact of some of these tax issues because they were not without cost; once he considered the facts and other national priorities, he did not include them in the letter.

Senator DOMENICI. Well, I am not sure since I got here for only a little part of Senator Hatfield's comments when he was discussing the opening of other oil fields, which both Secretaries of the Interior and Energy have very strongly supported. Let me suggest that on page 73 of this report, you state: "An import fee is essentially a Drain America First Program. A fee raises the U.S. crude oil prices and encourages accelerated production of U.S. reserves."

I wonder why that same logic would not apply to the OCS leasing, and to the Arctic National Wildlife Refuge. Wouldn't that also be a "drain America first?"

Mr. MARTIN. I think that the issue of ANWR or a more aggressive OCS leasing is more of a longer term issue and that, indeed, if you take action now, those resources will be realizable post-2000 period. So, I do not think it is exactly the same.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator FORD. Thank you, Senator. Dan, we have already gone past your position since you left.

Senator EVANS. I left and returned. Whatever your——

Senator FORD. We are trying to move on here. We have been going for a little while. And Frank, do you have some questions you want to ask? I can forego my time.

Senator EVANS. I have one or two questions.

Senator FORD. Can we limit it then to one or two, Dan? I will let you go next.

Senator EVANS. Let me return to some of the questions that Senator Hatfield asked. It seems to me that the administration both in this document and in testimony that has consistently been given before this committee over the past several years that I have been here has focused their energy further on few elements. Tried to advance nuclear clean coal, let the market take care of the rest. It seems to me that is a mighty narrow prescription for our energy future. Neither coal nor nuclear is going to do very much about our

transportation problems, which is primarily what our oil crisis is all about.

Do you think it is a wise idea, and do you support—I suppose you do—the administration's view that fuel efficiency standards for automobiles are passe, and no longer needed?

Mr. MARTIN. Let me say first I think they were useful. I think they were very useful particularly when prices were controlled.

Senator EVANS. You don't think prices are controlled now or in danger of being controlled?

Mr. MARTIN. No. And I think there is also an issue here of diminishing returns. Right now we know going that extra mile of efficiency might cost up to 100,000 jobs, the Federal Trade Commission says.

I think we need a new concept in the transportation sector, and that is why we are proposing to do an alternate fuels study as to what are the alternatives for the longer term. And the Vice President is looking at institutional barriers to the introduction of alternate fuels. So, I think that is where I stand.

I do not dispute that it was a useful policy. I think it got us going, but I think now it has outlived its usefulness.

Senator EVANS. I have always been interested and never been able to find out how in the world they arrived at that figure, why they would consider an extraordinary loss of jobs because of efficiency. That is an interesting concept. You can tell me if you know why.

Mr. MARTIN. Well, it was the Federal Trade Commission number, but it had to do with competition from abroad and the mix of cars imported into the United States in their calculation.

Senator EVANS. In other words, that was saying we don't make cars as efficiently as anybody else, so fuel efficiency standards would cause more imports?

Mr. MARTIN. I would rather you ask them that or send them a letter. I would hate to defend them.

Senator EVANS. I would suggest that it is not a good idea to utilize a statistic as part of an argument if you don't understand the statistic.

Mr. MARTIN. I think it is important to note though that the average automobile sold this year was actually above the CAFE standard. So, indeed, Americans still prefer efficient cars.

Senator EVANS. Well, we have successively now, twice in the last two years, lowered the fuel efficiency standards. The administration——

Mr. MARTIN. I think the average was 27 miles per gallon this year. I think that is good.

Senator EVANS. The average is 27. Two out of the three automobile manufacturers could not meet the former fuel efficiency standards, however, which were 27½ and which were successively lowered to the current 26. It seems to me that—and we have done some figuring. Maybe it is not a big item, but between 70 million and 100 million barrels a year are saved just from the 1½ miles per gallon that was reduced by the administration. Isn't that going in the wrong direction?

Mr. MARTIN. Again, it is the case where you have to look at this contrasted with other national priorities and do a balance of the

cost and benefit of this policy not only in the energy sector, but compared across the board when the administration does that cost benefit analysis. We believe it has outlived its usefulness from an energy efficiency point of view because other national priorities override it.

Senator EVANS. Are those other national priorities building bigger cars?

Mr. MARTIN. No. They mean preserving jobs in key sectors or key priority.

Senator EVANS. It seems to me that a fundamental base for research and development policy, whether it is in energy or most anything else, would be to provide adequate funding for a wide variety of future potentials knowing that in basic R&D you can't predict what is going to happen—that is the very nature of it—and that if you provide adequately or perhaps even amply in a wide variety of fields, then science itself and discovery will eventually guide you in the right path. Is that a pretty good policy?

Mr. MARTIN. I agree entirely. And that is one of the reasons we are proposing doubling the National Science Foundation budget this year.

Senator EVANS. But why at the same time has there been not only a radical decrease in the amount of money that is set aside for alternative energy sources, but an unwillingness of the administration to even spend the amount that was appropriated by Congress? We have successively in the last two years now had recisions proposed that would essentially use up all of the money that is set aside for those alternative energy R&D sources.

Mr. MARTIN. I believe strongly, Senator, that R&D in this area is very important, and I think we have to work with the Congress to find out which are the right priorities to continue to fund as we face a greater constraint in the budget process.

Senator EVANS. Do you believe it is appropriate even with budget constraints and that this field is so important that we at least ought to spend the amounts of money that Congress has felt it important enough to appropriate?

Mr. MARTIN. I think that is something that we need to talk about with the Congress if you feel we are not coming up with the appropriate funding that you would like.

Senator FORD. Speak up.

Mr. MARTIN. I would be glad to provide that one for the record.

Senator EVANS. Well, I wish you would.

[The information follows:]

Through continual interaction with industry, the Department refines its multiyear priorities for the various solar and renewable energy technologies. The FY 1988 budget request for solar and renewable energy reflects a Departmental consensus research agenda within the context of overall budget constraints to reduce Federal outlays and reflects a commitment to sustain a balanced effort among renewable energy technology options. The Department believes that research of the type proposed for FY 1988 funding addresses the highest priority fundamental scientific and technical issues necessary for a technology base upon which industry can establish a broad range of renewable energy technologies as fully competitive energy supply options over the next several years. In formulating priorities, the Department technology managers consider a number of factors including pace of research accomplishment, industry capabilities and priorities, the Federal role in research, the magnitude of potential payoffs, and the nature and degree of scientific or technical risks.

The Department requested a deferral of $22,394,000 in FY 1986 out of an appropriation of $215.5M. A rescission was proposed in FY 1987 totalling $13,100,000 out of an appropriation of $173.7M. The President's FY 1988 budget request for renewable energy represents essentially a level funding program compared with the FY 1987 request. The deferral and rescission proposals included a number of Congressional interest projects, which have

tended to entail engineering development or demonstrations which DOE and the affected industries view as being of lesser industry-wide value and most appropriately within the province of the private sector. The types of research proposed for FY 1988 are essential to establishing the technical and economic viability of these technologies beginning in the 1990s when the Nation's energy supply system will most need additional options. The program proposed for FY 1988 represents a commitment on our part to realize the potential of renewable energy over the upcoming decade, while recognizing the proper Federal role and the need to reduce Federal budget deficits.

Mr. MARTIN. I don't have the budget numbers before me here at the moment.

Senator EVANS. It deals directly with I guess the defense of almost total recision for each of the last two years of these alternative energy R&D monies, and if you could for the record tell me how that comports with the concept that you agreed was an important one to try to give ample funding in the variety of sources and let the science work things out.

Mr. MARTIN. I recently met with our R&D board, the ERAB, and they are doing a study on competitiveness, on what R&D projects should be funded over the next 10 years. And I encouraged them, if they come up with any new and great ideas about what to fund, if they would please tell us what are the low priority items that we can get rid of because I think from now on we are going to be faced with more and more budget constraints. And we are just going to have to be choosier in those projects that we do fund because clearly we don't want stop, go, stop, go, stop, go. We want continuity of R&D programs, and we need to work with the experts and with the Congress to find out what is the slate of R&D priorities that we should support. So, with that in mind I would be glad to provide you with the answer to your question, or I would even work with you to make sure we fund the right projects.

Senator EVANS. Okay.

Senator FORD. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman. I have just a few regional questions that I would like to pursue, and then one on a little broader base.

Critics of opening ANWR have indicated that the coastal plain has a potential of 200 day supply of crude oil. And I think we are both aware that this is not really a realistic way to measure reserves of the contribution that ANWR could make to our energy security. How do you respond to the argument 200 days and the broad area of guess work that is implied in what the reserves may be?

Mr. MARTIN. Well, Senator, I would like to point out that that great reservoir oil in Prudhoe Bay, which came on in the early 1970s and is peaking in the next few years is going to be much lower by the year 2000. In fact, we estimate it might be 500,000 barrels a day and going downward. And we have got to have something to replace that oil if we are not to see an even steeper falloff from what Senator Nickles says isn't even steep enough.

The only thing we see that can replace that much oil, that quantity of 1½ to 2 million barrels a day, is the ANWR and that is why we are very strongly supportive of it and recognize that we are going to have a future post 1995 even if we cut if off there. And that is the one potential we think must be explored and developed.

Senator MURKOWSKI. Well, in view of the Prudhoe Bay's current contribution, which is about 20 percent of the total domestic crude oil produced in the United States today, how do you respond to the charge that the Reagan Administration is basically putting together an energy policy that drains America first when we recognize that our imports are currently what, 11, 12 percent?

Mr. MARTIN. Much higher. Our imports?

Senator MURKOWSKI. Well, I am talking about from the Mideast.

Mr. MARTIN. Our imports are about a million barrels a day from the Mideast right now.

Senator MURKOWSKI. We are importing about 6 million barrels a day.

Mr. MARTIN. Right.

Senator MURKOWSKI. Or 40 percent. So, is that your answer that we are really not draining America first? We are going to increase our imports because we have no other alternative given the low price of oil and the lack of expiration and drilling rigs and so forth? I am trying to equate to the charge that some environmental groups, extreme environmental groups, particularly charge the administration with seeking to drain America's reserves first. How does the energy policy address this?

Mr. MARTIN. I think we want to insure adequate American supplies during our period of most vulnerability to a tense international setting which we see in the next 15 years out of the Middle East. So, we are certainly developing our own reserves during that time for our own protection, which we think is vital.

We also recognize that those reserves might be used in the period of 2000. We better have something post-2000 particularly in the area of renewables and more conservation and coal and nuclear through greater electrification. But the period we see as the most vulnerable for our country really is the 1990s and maybe earlier. That is why we need to get those reserves developed.

Senator MURKOWSKI. As a consequence of the incident of the U.S.S. *Stark* and the escalating tempers, if you will, that are evident in the Mideast, I am curious to know if in any way you would have changed your general evaluation of our energy policy in your report recognizing that today we are preparing to flag what? Eleven Kuwaiti ships which would involve putting at least U.S. captains and some small crew on those ships. We are committing the resources of a portion of our fleet, obviously, to defend those ships. We are going to have to define a policy on the specific rules of engagement. If a Kuwaiti American flagship is hit, we are going to have to make some decisions to respond.

The beneficiaries of our presence I find very interesting inasmuch as I believe we are importing about 6 percent of our crude oil supply from the Persian Gulf. About 35 percent goes to Western Europe, and the balance goes to the Japanese.

Isn't it rather obvious that we are going a little bit beyond the role of a beneficiary in relationship to what we receive, on the one hand, to what we are deploying on the other by maintaining the sea lanes open for others, and, while it might not be the role of the Department of Energy, it certainly seems to be an appropriate role to rethink that some of these other nations that are benefiting really aren't making much of a contribution. We are prepared to provide, you know, our Navy and risk the lives of Americans to maintain the sea lanes, but we are not directly the beneficiary.

Mr. MARTIN. Well, Senator, you know President Reagan has been concerned since really 1983–84 when the tanker war began. Since that time over 200 ships have been hit. I think it is a very regrettable incident with the U.S.S. *Stark,* but it is just a constant reminder of the volatility of that region, and the lingering and dangerous

Iran-Iraq war which is now going into almost its seventh year. So, we have watched the situation very carefully.

You raise a good point. We do not get much of our oil from this region. It is increasing, but it is still less than a million barrels a day. Europe and Japan are heavily dependent on this region. At the same time we know we are part of an integrated oil market. And a disruption in the Middle East may ultimately affect us even though we might not be that dependent at the time. You need only go back to 1979 with the Iranian revolution. We did not get much oil from Iran, but Europe and Japan did. And when the oil was diverted, our oil that was coming to our markets was diverted to Rotterdam and the Orient because they were paying higher prices and, therefore, we ultimately suffered. It is an integrated oil market. So, we are interested in the Persian Gulf.

Secondly, it is my understanding that the French and British also maintain a military presence in the region and are helping to carry some of the burden. But I think it is another example why other nations should do a lot more in stock building and carrying their fair share of the burden in emergency preparedness. And clearly, if we were to use the SPR, well, we would be using it for the benefit of the whole world. So, it is time others start to carry the burden.

But there are a lot of good reasons for our presence in the Middle East, Senator: our support for Israel, our support for the pro-American governments on the Arabian Peninsula, our interest in the freedom of navigation; and I might also add our desire to contain a spread of the Iran-Iraq war. So, yes, we do carry an enormous burden, but I think it is in our best interest.

Senator MURKOWSKI. Well, I think you have made a point worth reflecting on as we view the merits of whether we should or should not be there, and if so, what role we are playing. But you are saying that in effect if we lose that source of production in the world oil pool we, the United States, will feel the consequences either in price escalations or other means.

But from the standpoint of this one Senator, Mr. Chairman, I am inclined to think that there ought to be a more proportional contribution to the effort to keep those sea lanes open as opposed to almost a singular effort. And I do not think Great Britain is in there anymore. I think they were, and we couldn't agree on a contribution. So, they pulled out and we have it all.

Thank you, Mr. Chairman.

Senator FORD. Thank you, Senator.

Two or three quick questions, Mr. Secretary. You favor the relaxation of the CAFE standards, and you said so a few moments ago. What is your attitude as it relates to filling of the SPR?

Mr. MARTIN. I would like to see a 100,000 barrel a day fill rate in fiscal year 1988.

Senator FORD. Do you have any influence with the administration?

Mr. MARTIN. One of the President's recommendations was to fill at a 100,000 barrel a day rate. If you would like, I will read it to you.

Senator FORD. Well, he hasn't put his money where his mouth is yet.

Mr. MARTIN. We will suggest that Congress and the administration have a challenge in finding offsets for that amount of oil, but we figure it is a high enough priority that we should be filling at 100,000 barrels per day so that we can achieve the 750 million barrel SPR by 1993.

Senator FORD. Well, it has been a tough fight, Dan. What offsets are you suggesting?

Mr. MARTIN. Oh, I don't have any specific recommendations.

Senator FORD. That is typical. You know, we are sitting here with you wanting to fill it at 100,000 barrels per day, and what is your recommendation for an offset?

Mr. MARTIN. We are working in the administration to make some recommendations, and we would be glad to hear what the Congress feels and work together with you.

Senator FORD. Why don't you send something up here, and let us hit it? Throw the ball up here once and let us hit it. We met your challenge a while ago, and I suspect Senator Domenici will have some few things to say.

Senator EVANS. Mr Chairman, I might just note that 100,000 barrels a day is just a little more than 1 mile per gallon on the fuel efficiency standard. That is all it would take to be the equivalent of that without having to pony up the money.

Senator FORD. Well, both wouldn't hurt.

Senator EVANS. Both wouldn't hurt. You are right.

Senator FORD. Let me ask you a couple quick questions, and I will get right on with it.

The President's report to Congress did not identify any level at which energy imports constitute a threat to our national security. The Omnibus Budget Reconciliation Act of 1986 requires him to make such a determination. In preparing for the President's report to Congress, did you or Secretary Herrington make any recommendations about what import level constitutes a threat to our national security?

Mr. MARTIN. No, we didn't, Mr. Chairman. We are very familiar with the revision that you outlined. It is just very hard to do, and the reason being, if you have 50 percent oil imports, the situation could be worse or better depending on what else is happening. So, it is very hard to say at quantitative levels——

Senator FORD. But what you are telling me is that you will never make a decision because you will never have all the facts, but you expect us to make a decision without the facts. What you are saying, you do not know what is going to happen when it gets at 50 percent imports. Well, I don't either. If I had a crystal ball, I would be up in the oval office. I wouldn't be down here. We all have to make determinations. We all have to make decisions in the light of day, vote, and hope that history proves us right. But you won't make any recommendations. The administration won't make any recommendations because you don't know what is going to happen when you get at 50 percent.

You have to be like Harry Truman said one time, that he would like to have a one-arm economist. You say on the one hand it is this, but on the other hand, it could be that. Let's just say in our judgment it is this. Throw it up here and let us challenge it.

Mr. MARTIN. I think it is important to look at the oil import level, but I think it is also important to look at the imports of other nations. Japan imports 4 million barrels a day today.

Senator FORD. I know. Let's not lay it off on Japan. Let's not lay it off on anyone—the law required the President to make that judgment and send it to Congress. Now, what input did you have, and what recommendations did you make to the administration as it related to the requirement of the law?

Mr. MARTIN. We basically advised that just looking at the oil import level by itself is not sufficient to assess whether American national security interests are, indeed, threatened. And the last page of our testimony lays out a series of indicators which together with the oil import level give us a better basis for making a decision.

Senator FORD. And what level of imports threatens our national security?

Mr. MARTIN. I would clearly say that our low price scenario, as outlined in the Energy Security report, poses a national security problem for the United States.

Senator FORD. Why didn't he say that, and why don't you say that? And why don't you say that to comply with the law?

Mr. MARTIN. Well, I am saying that now to you. I am saying that now. Indeed, the President has——

Senator FORD. Well, it wasn't in the report.

Mr. MARTIN. The President says that imports can be over 50 percent, and that poses a national security problem—in the letter, if we read the letter. But I think that again our scenarios are based on a lot of different data from a lot of different variety of sources, which together assess our national security.

The President has said we should never again be dependent on OPEC. He said that even a year ago, and yet our scenario, our low-price scenario says that 60 percent of the world's oil could be produced by OPEC in 1995. So, sometime before we reach that level, I think we will face a national security problem.

Senator FORD. Well, that will be starting in 1989 and 1990, and the next administration will have to make that decision. That is what you are saying.

Mr. MARTIN. What I am saying is we tried to provide a data bank, a technical base which quite frankly—350 pages—we didn't do it overnight. This was done for the Congress as well as the President. It puts more detail on the table than we have put on the table for six years. And we think we have done a pretty good job. And we think it provides a basis for the Congress and us to decide at what level are national security concerns raised. So, I think we have done our homework, and I think——

Senator FORD. If you have done your homework, then you should make a recommendation. And that recommendation should be based on your best judgment. And then it is up to determine, or if we judge that proper, then that would be our responsibility. It would be on our watch. But then you would have been complying with the law.

And basically you could write a letter, that sort of thing. Or you can say what they say, but that report from the President should lay out at what level imperils our national security.

Now, you were on the National Security Council staff at one time, as I recall, before going to DOE. Do you have any personal views—I am talking about personal views. Let's get the blinkers on now—on what level of imports constitutes a national security threat without going into all these scenarios, if this happens, if that happens? Do you have any level coming from the National Security Council?

Mr. MARTIN. I have a definite view on that, Senator. If we could put up the low-price scenario, I feel that if oil prices remain low, and we get to levels of 50 percent dependence by the early 1990s, and if the situation is comparable in Europe and Japan, and if other key producers around the world, such as the North Sea and Canada and Mexico, aren't producing and our coal industry is stymied because of acid rain, and nuclear power doesn't go forward because of Chernobyl, I indeed think that import situation raises serious national security concerns. We have never had 10 million barrels a day of imports into this nation, and yet that is what our study says could happen by 1995.

Senator FORD. Or sooner.

Mr. MARTIN. And let's face the facts. Today the Middle East is a national security problem, and our dependence is relatively low. As we move out into the future and our dependency increases, the situation we see in the Persian Gulf today where we don't see any improvement in the situation, remains a very serious cause for concern.

Now, I have qualified that by saying if low oil prices persist. Oil prices have moved up a little bit. Again, the Cushing spot price is close to $20. If we are on a higher priced trajectory, then indeed our dependency will be lower. So, those are my personal views.

Senator FORD. I wish we could get a flat statement as to what the administration considers an import level that would imperil our national security and say that's it. And I would like for you to give us some budget offsets as it relates to the SPR. You know, you throw your palms up. As long as your palms are up, you are looking for an answer from somebody else. Get your palms down and say that's it. Can you do that?

Mr. MARTIN. Yes, Mr. Chairman. If I can just add in the other indicators I think are important which in addition to the oil import fee will be assessed.

Let me say also that there are other pressing national security concerns now too. And we made a strong argument a year ago to fill the SPR, and one of the reasons we used to reverse the moratorium was for national security reasons. And yet when we came to cabinet level, we had trouble finding money partly because the national security community needs a fair amount of money whether it is for security assistance or for the defense budget. So, indeed, what we are dealing with here are a lot of high priorities that must be juggled within a very limited budget. So, it is a very challenging problem.

But I will do my best to provide you with the offsets.

Senator FORD. That is all we can ask of you to do your best, and your best is a week turnaround in written questions from this committee. And I have you on record saying that.

And I say that the hearing will remain open for two weeks to allow Senator Domenici and others to accept the challenge and see if they cannot come up with something that will cause you to rethink maybe your position a little bit.

Senator EVANS. Mr. Chairman

Senator FORD. Do you want to take over the committee? I have just got to go.

Senator EVANS. Just one final comment which was brought up by I thought your excellent line of questioning that you just concluded.

I chaired the Pacific Northwest Power Council. We were given the task to come up with a 20 year electric power plan for the Pacific Northwest. The first thing we did was to abandon the idea of trying to create a single line future knowing that the instant you do that you have proven yourself wrong. We figured we could figure the boundaries faster and easier and more accurately than we could have the most likely situation. So, we did that.

But then we said, all right, is there a set of scenarios that will allow us to meet whatever happens within the framework of that boundary. And the end of 20 years the difference between the high and the low were thousand of megawatts, and we successfully did come back with ways in which to meet any of those scenarios.

It seems to me that that is the answer to the question that the Chairman asked. Instead of just continuing to monitor the situation, these indicators that you have on the last page of your testimony—sure, they are all different elements, but many of them are tied together. Now, they are not going to move in wildly different directions. Many of those indicators are quite tied together, and if one moves, the other one will move with it.

Is it just impossible to try to create that same kind of future that says maybe there isn't a single specific percentage of imports, but to do it so that we can put a band of national security problems or areas in which there would be problems and how we would react to those so at least we have some idea of how the Nation intends to cope with whatever happens and has some scenarios and some concerns about what constitutes national security problems? If you can't come up with a specific immutable figure as a percentage of imports, there certainly ought to be a formula or a way in which to identify what we do under these various circumstances.

Mr. MARTIN. I think that is a more interesting approach than the specific number. But we will address the specific number. And it is true. A lot of these are linked together.

Senator EVANS. Sure.

Mr. MARTIN. But we went through a period in the late 1970s of oil import targets at the Tokyo Summit and other things. And we found that quantitative objectives sometimes just look silly a few years after you have gone through them. But we will do our best to answer the questions in a week, Mr. Chairman.

Senator FORD. This committee is adjourned.

[Whereupon, at 3:55 p.m. the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Committee Questions From William F. Martin

QUESTION FROM SENATOR JOHNSTON

Question 1: What are the results of your cost-benefit analyses of the effect of an oil import fee if you use all of the assumptions below?

Assumptions:

- $24 per barrel floor price for crude oil (fee would be the difference between the floor price and the price paid as in S. 971);
- $26.50 per barrel floor price for refined petroleum products and petrochemical feedstocks (as in S. 971);
- Revenues derived from the fee would be used to reduce the deficit;
- The economy would adjust to the macro-economic impacts of an oil import fee within one year;
- 7.2 percent discount rate;
- 1988 oil disruption that lasts for one year;
- oil field job multiplier of 4.0, not 1.0; and
- The "no fee" case would include a $9 billion tax increase for deficit reduction.

Answer: Analysis of the impact of the alternate assumptions provided would require significant changes to the modeling structure used for the original DOE import fee analysis. For this reason, it would be necessary to re-specify some of the Intermediate Future Forecasting System (IFFS) models and to develop some new techniques to accommodate these new assumptions. Revising the model to accommodate dual prices for crude oil and products, and which used an explicit "job

multiplier" would take some time. Also, the model would not be able to estimate the economic inefficiency caused by federal price setting implicit in the product import fee assumption, nor the related regulation that would evolve because of pressure from the many refiners, importers, and distributors who would seek special treatment by Federal regulators.

In addition, several of the suggested assumptions change values that were outcomes of the DOE study. For example, the original DOE work did not incorporate an assumption that the macro-economic adjustments to an import fee would be complete within a year. The analysis relied on empirical findings concerning the length of the adjustment process. Likewise, the modeling does not incorporate an assumption about a job multiplier. The employment findings contained in the Energy Security report were based on coefficients of employment changes relative to GNP changes and to oil price changes in the case of oil service employment. The present DOE model has no provision for separately varying the job intensity of an import fee as a direct input assumption.

The requested discount rate change to 7.2 percent could be accommodated easily, but we believe such a change would make little difference in the results, since the disruption is posited for 1988. Imposition of the fee in 1988, combined with

a 1988 disruption, would present difficulty for the analysis since one of the DOE assumptions is that the fee would be suspended in the event of a disruption, to avoid exacerbating price increases. If a disruption occurred in 1988, the fee would never take effect.

Using fee revenues to reduce the deficit matches the assumption used in the DOE work. Including a $9 billion tax increase as part of the "no fee" base does not appear to be a realistic assumption on which to estimate the effects of a fee versus no fee. Also, the $9 billion tax increase for deficit reduction does not take into account the fee-related effects on budget outlays and receipts. Much more would have to be known to attempt to analyze the implication of the $9 billion tax increase correctly. Finally, the Administration believes that the appropriate policy to achieve deficit reduction is to cut domestic spending rather than creating new taxes.

Because of the difficulties involved in accommodating some of the assumptions that differ from the structure of the model components used in the DOE work, the request cannot be met until technical problems and plausible assumptions are established. Staff discussions concerning what can be accommodated within the structure of available modeling tools could be an appropriate next step.

QUESTION FROM SENATOR JOHNSTON

Question 2: For each of the initiatives identified in the President's Energy Security Message to Congress (Presidential Message 41, May 6, 1987), identify the projected oil production potential (or savings in barrels of oil equivalent), the most likely date of that production (or savings in barrels of oil equivalent), and the period for that production (or savings in barrels of oil equivalent). For purposes of this answer, assume that each of the initiatives identified is enacted by the close of the 100th Congress.

Answer: The initiatives identified in the Presidential message are repeal of the Windfall Profit Tax (WPT); comprehensive natural gas reform, including wellhead price decontrol, mandatory contract carriage and demand restraint repeal; approval of the Department of the Interior's five-year offshore oil and gas leasing plan; reducing the minimum bid requirements for Federal offshore leasing; permitting environmentally-sound energy exploration and development of the Arctic National Wildlife Refuge (ANWR); ensuring the future viability of nuclear power through nuclear licensing reform, reauthorization of the Price-Anderson Act, and progress in development of a nuclear waste repository; and two technical changes in the tax code related to the percentage depletion allowance -- repeal of the "Transfer Rule" and increasing the net-income limitation from 50 percent to 100 percent.

Estimates of impacts on oil and gas production from enactment of any of these initiatives depend on the underlying assumption of economic and other variables. Under the low oil price scenario from Energy Security, repeal of the WPT would have virtually no impact from 1987-1991 with higher prices, the WPT could discourage oil investment in the 1981-1991 period Repeal of the Transfer Rule would save 55,000 barrels/day of oil equivalent from 1990-1995; and increasing the net-income limitation would save 58,000 barrels/day from 1990-1995. Natural gas reform would increase production of natural gas by an estimated 225,000 barrels/day through 1996.

Any production from ANWR would not occur until after the year 2000. According to Energy Security ANWR could hold up to 9 billion barrels of recoverable oil; if it does, production could exceed 1.5 million barrels per day.

No production estimates are available for the offshore leasing initiative, but the mean estimate for outer continental shelf reserves is 12 billion barrels of recoverable oil and 90 trillion cubic feet of recoverable natural gas.

QUESTION FROM SENATORS DOMENICI, JOHNSTON, AND NICKLES

Question 3: If you exclude the macro-economic impacts you calculated for an oil import fee, what would be the results of your cost-benefit analysis using your micro-economic models and your own assumptions for a $5 per barrel import fee?

Answer: Excluding macro-economic impacts result in an incomplete assessment of the economic impacts of a fee. For example, a $5 per barrel oil import fee would show under the Department of Energy analysis, an import cost saving of $18 - 22 billion over the period 1988-1995, depending upon the world oil price assumption employed. In the DOE analysis, an import fee yields energy security benefits with a 1987 present value of $3 - $4 billion, due to an assumed 100 percent probability of an extremely severe oil disruption in 1995. In addition, an oil import fee of $5 per barrel produces economic welfare losses of $2 - $3 billion over the time period. The above findings assume that world oil prices fall in response to the tariff. The Energy Security study also reviewed cases where oil prices remain unchanged in response to a tariff. If world oil prices remain unchanged, there would be no micro-economic benefits from an oil import fee.

Imposition of an oil import fee results in substantial macro-economic costs. Even if one disputes a particular method of calculating those costs, some figure must be used and if at all plausible will be larger than the expected value of micro-economic benefits. No import fee analysis can be complete without some recognition of the macro-economic impact of the fee.

QUESTION FROM SENATORS DOMENICI, JOHNSTON, AND NICKLES

Question 4: What are the results of your cost-benefit analyses if you were to exclude the macro-economic impacts and used the assumptions below?

ASSUMPTIONS:

- $5 per barrel import fee (not adjusted for inflation);
- 7.2 percent discount rate;
- 1988 oil disruption tnat lasts for one year; and
- oil field job multiplier of 4.0, not 1.0

Answer: See response to question 1. This study request should be preceeded by staff discussions of what can be accommodated within the structure of available modeling tools.

QUESTION FROM SENATOR BRADLEY

Question 5: What confidence do you personally have in the ability of any expert to project accurately future U.S. oil demand, oil imports, price, etc.?

Answer: The record of the U.S. Government as well as the majority of oil industry forecasters and other industry analysts has not been very good. Unfortunately, I don't think we will ever be able to make oil market projections with very much confidence. The oil market has been very volatile and can be affected by unpredictable events. The oil market has in the past shown much greater volatility than is characteristic of price projections. For that reason, our projections, as set out in the Energy Security report, were based on a range of plausible assumptions. Actual oil market developments may evolve along either the upper or lower end of the range, may fluctuate between the two extremes of the range, or may, although we think it unlikely, follow a path outside the range. As long as we rely on the operation of a free domestic oil market, we need not be overly concerned about the fact that we cannot foresee the future with great precision. The operation of the free market economy provides rewards and incentives which encourage market participants to adapt quickly to changing circumstances.

QUESTION FROM SENATOR BRADLEY

Question 6: A 50 percent oil import level seems to some in the Senate to be a "threshold" which, if crossed over, implies a national security threat to the U.S.

a. First, in the latest DOE "base case" scenario, when is it projected that will hit the 50 percent import threshold?

Answer: The DOE scenarios set out in the Energy Security report did not include a base case. That report included two scenarios: a higher oil price case and a lower oil price case. Under the higher price case, U.S. gross oil imports surpass 50 percent of consumption in 1995, and net imports do not reach 50 percent until after 1995 (the last year included in the projections). Under the lower price case, gross imports exceed 50 percent in 1991 and net imports surpass 50 percent in 1992. Even under this case, oil imports represent only about 20 percent of total energy consumption in 1992.

b. Second, projections are obviously dependent upon assumptions which are invariably subjective: using an alternative, but "reasonable" set of assumptions, can you envisage projections by respectable authorities which would foresee us reaching this 50 percent threshold in three or four years?

Answer: Using the assumptions of DOE's lower price case, U.S. gross imports could exceed 50 percent of consumption in 1991 -- in just four years. This case is based on assumptions that oil prices average about $14 to $15 per barrel until 1990 and then begin to

rise toward $22 per barrel by 1995. This case also includes a conservative estimate of non-OPEC reserves, a relatively high estimate of economic growth and a relatively low estimate of energy efficiency. Based on prices of the past several months, we do not appear to be on this lower price path.

c. Third, do you agree with the hypothesis that seems to underlie the 50 percent threshold that import dependency is equivalent to vulnerability? Aren't we less vulnerable to a disruption today than in 1973 even though oil imports are about at the same level today as then?

Answer: The degree of U.S. import dependency does not, by itself, provide an adequate measure of our energy security. There are some other factors, such as the level of worldwide excess production capacity, the ability to switch to non-oil fuels, the level of strategic stocks, and the Persian Gulf share of worldwide production, which are equally important. It is notable that U.S. gross imports in 1986 were 38 percent of consumption, compared to our 36 percent import dependence in 1973. The contrast between these two years is striking: in 1986, oil prices collapsed because of 10 million barrels per day of excess production capacity whereas in 1973, a supply disruption occurred which led to large oil price increases because little surplus production capacity was available and demand for oil was increasing at an

annual rate of 7 percent. It also is interesting to note that some countries which were 100 percent dependent on imports during previous supply disruptions experienced no gasoline lines or shortages, whereas the U.S. experienced shortages at a much lower import dependence level. Gasoline lines and shortages occurred as a result of our domestic allocation programs (abolished in 1981) rather than from our dependence on imports.

d. Fourth, although we can disagree on when the U.S. will pass this threshold, is there any reasonable doubt that the U.S. will someday - whether it's five or ten years from now is another question - reach this threshold?

Answer: Although current DOE projections would indicate that the U.S. is heading for an import dependence of more than 50 percent sometime in the next decade, there is reasonable cause for doubt that it will. For example, an oil supply disruption could occur, which could result in higher oil prices and lower imports. Alternatively, technological breakthroughs in conservation or non-oil fuels could significantly reduce demand for oil in the 1990's, the

period during which the U.S. would reach the 50 percent dependency threshold under the higher price scenario. Our past experience with oil market forecasts teaches us that even the most plausible -- or "inevitable" -- projections can turn out to be false.

QUESTION FROM SENATOR BRADLEY

Question 7: Too often we seem to focus on "shortages" - isn't the real problem the higher prices that temporary shortages create? Given a free market approach - as opposed to price controls and government allocation - isn't the U.S. price inevitably the world price? Isn't this the case irrespective of import volume? Wouldn't shortages in the world market, for example caused by some catastrophe in the Middle East, trigger sharply higher world prices and U.S. prices, even if the U.S. didn't import a drop of foreign crude?

Answer: Yes. As pointed out in our Energy Security report, the world oil market is highly integrated. It would be impossible for the U.S. to insulate itself from that market. We are participants in the world oil market, and we are subject to the price effects of oil supply disruptions or gluts no matter how small our level of imports.

QUESTION FROM SENATOR BRADLEY

Question 8: What in your impression is the best U.S. policy to deal with the threat of sudden world shortages? Isn't the most effective U.S. response to use the SPR? Wouldn't an effort to enlarge the SPR and, consequently, our ability to respond to threats, actually result in increased oil demand and imports?

Answer: The U.S. policy for responding to oil supply disruptions is to draw down the SPR early and at a rapid rate and to allow the domestic market to operate freely. Use of strategic stocks is and will remain our most effective means for responding to short-term interruptions in oil supplies. The President has proposed increasing the fill rate for the SPR to 100,000 barrels per day, providing that budget offsets are identified. This will increase U.S. imports by 65,000 barrels per day compared to the Administration's previous proposal for filling the SPR in FY 1988. Of course, imports for the SPR could quickly be terminated if necessary as a response to oil market events.

It should be noted that the Administration is working with friendly and allied oil-consuming countries to coordinate policies for the use of stocks and complementary responses in the event of an oil supply disruption. Thus, the U.S. response policy should be viewed as an international as well as a domestic policy.

QUESTION FROM SENATOR METZENBAUM
GENERAL

Question 9: I understand that Mr. Herrington was recently in Europe to urge our allies to increase their strategic oil reserves and that they asked, what is the U.S. doing to reduce its domestic petroleum demand? How does this Administration respond to this question?

Answer: Today, the United States uses virtually no more energy, and less oil, than it did in 1973 -- although its population is still expanding and the Nation continues to turn out more products and services. Without the improvements in energy productivity that have taken place since 1973, the U.S. would now hypothetically require the equivalent of about 14 million more barrels of oil every day. Advances in technology have accounted for two-thirds of the recent energy-productivity improvements in U.S. industry and three-fourths of those in transportation, resulting in more product output per energy unit and more miles per gallon.

Energy consumers, responding to market forces, have made their own fuel choices or invested in various means to use energy more efficiently. Improvements in average energy efficiency can be expected to continue, despite the recent decline in world oil prices, but perhaps at a slower rate.

In addition, the Department of Energy supports high-risk, long-range research in energy

conservation, energy efficiency, and renewable energy resources aimed at making new and advanced technologies available for commercial development. The Administration also seeks comprehensive deregulation of natural gas and encourages the development of safe nuclear power, in order to provide additional energy alternatives for energy users.

Transportation alone uses more oil each year than the Nation produces, accounting for more than 62 percent of all U.S. oil use. Fifty-nine percent of the oil used for U.S. transportation is concentrated in autos and light trucks. Thus, alternative fuels have huge potential to displace oil use in transportation if they are cost-competitive. The most promising strategies for the Nation are to encourage the application of energy-efficient technologies wherever and whenever they are cost-effective, and to develop the potential for fuel flexibility in motor vehicles. To this end, DOE is conducting a comprehensive cost-benefit assessment of alternative fuels -- including methanol, ethanol, compressed natural gas, and electric power.

QUESTION FROM SENATOR METZENBAUM

CONSERVATION RESEARCH

Question 10: This Energy Security report recognized the role which greater energy efficiency can play in reducing petroleum and overall energy demand. Yet, in terms of allocation of funding, conservation programs always come in dead last. For example, the fiscal year 1988 budget request for energy research and development is $2.9 billion, yet only $80 million, or less than 3 percent, is requested for conservation R&D. Do you think that this allocation of funding is consistent with the opportunities which conservation offers to enhance our national energy security?

Answer: In general, overall federal budget constraints have governed our request level. We have asked for what is necessary to maintain program goals, although it will admittedly take longer than at higher funding levels. Although the conservation R&D request for FY 1988 is only about one-half of the FY 1987 appropriation, it is 12% higher than the FY 1987 request, and it represents almost 25% of the non-nuclear energy R&D request.

We have assigned priority for Federal funding to more fundamental research which cannot be done by industry alone, and which offers the greatest potential for energy savings or alternative transportation fuel use.

We plan our program with industry and have extensive cost-sharing to assure that our priorities are correct and that there will be effective technology transfer.

Some of the decrease in our request can also be explained by the fact that there are a number of projects that will be coming to a planned conclusion in FY 1987, such as the Automotive Stirling Engine and the nickel cadmium battery technology projects.

There are other projects that were not part of our planned FY 1987 program and are therefore not requested in FY 1988, such as the Tufts University Facility and the Automotive Gas Turbine (2nd Contractor).

QUESTION FROM SENATOR METZENBAUM

CONSERVATION RESEARCH

Question 11(a): Do you know what a high frequency electric light ballast is?

Answer: An electric light ballast is a device necessary for the operation of any discharge type electric lamp such as the fluorescent lamps used widely in commercial buildings. Conventional ballasts use a magnetic induction coil and operate the lamp at line frequency, 60 cycles per second. DOE was instrumental in developing the initial concepts for the high frequency electronic (solid state) ballast which operates the lamp at 20,000 cycles per second. The electronic ballast saves about 20% of the energy used in the conventional ballast lamp system. These new ballasts are available from several manufacturers and are beginning to penetrate the market.

QUESTION FROM SENATOR METZENBAUM

CONSERVATION RESEARCH

Question 11(b): Do you know what low emissivity glass is?

Answer: "Low emissivity glass" is glass which is coated with a metallic coating which reflects a portion of the heat (i.e., long wave infrared radiation) being radiated through the window. The lower the emissivity, the better the heat reflectance. The concept has been known for some time, but initially the major glass manufacturers did not feel it was of commercial interest.

The object of research on low-E coatings has been to lower the emissivity while improving the transmission of visible light and optical clarity. DOE research during the 1970s and early 80s helped to develop interest in the private sector in the further development of low emissivity coatings with very good optical properties. However, these coatings with good optical properties are not durable and can be used only in sealed glass windows. Recent DOE and private research has focused on the development of durable coatings with good optical properties (i.e., emissivity less than 0.2, transmissivity greater than 0.7, and high optical clarity).

QUESTION FROM SENATOR METZENBAUM

CONSERVATION RESEARCH

Question 11(c): These are technologies developed at DOE financed labs at a cost of $5 - 10 million. They have since been commercialized and, when they saturate the market in the mid to late 90's, they will save consumers and the U.S. economy roughly $6 billion per year. That's a return on investment of roughly 1000 to 1. Don't you think it would be prudent to continue this type of research rather than cut it by 85% as this Administration is doing?

Answer: These are, in fact, outstanding examples of successful DOE research. These examples demonstrate why, even though our budget request is governed by overall Federal budget constraints, the Department continues to emphasize the highest priority basic and applied research which offers the greatest potential for energy efficiency improvements or alternative fuel use. The budget request reflects our best judgment as to how we can maximize our resources to advance the state of the art in these technologies, while at the same time contributing to the Congressional and Administrative goal of reducing the Federal budget deficit. At the same time it should be pointed out that in areas of more applied research and development, such as those in which budget reductions were made, the great bulk of R&D expenditures relating to specific energy production, distribution, and use will still come--as they traditionally have--from private sector entrepreneurs competing with each other in order to make a profit.

QUESTION FROM SENATOR METZENBAUM
QUESTIONS ON AUTOMOBILE FUEL DEMAND

Question 12: Do you have an estimate of how much the Administration's rollback of the automobile fuel efficiency standard from 27.5 mpg to 26.0 mpg will increase petroleum demand?

Answer: We do not believe that the lowering of the Corporate Automobile Fuel Efficiency (CAFE) standards will have a significant effect on petroleum demand. Fuel economy levels are being determined largely by the marketplace and this is likely to continue to be the case whether or not manufacturers are subjected to penalties for meeting 27.5 or 26.0 mpg level.

If actual fuel economy achieved by manufacturers were 26.0 mpg instead of 27.5 mpg for model years 1987 and 1988, fuel demand would increase by a maximum of 40,000 B/D in 1988 and 1989. This effect would decrease about 20,000 B/D by 1995. This should be viewed as a worst case estimate of the impact of lowering the standards; the actual effect will likely be less. It must be noted that the average fuel efficiency of new cars purchased in 1986 was 27.9 mpg, more than the original CAFE standards for the year of 27.5.

QUESTIONS FROM SENATOR METZENBAUM
QUESTIONS ON AUTOMOBILE FUEL DEMAND

Question 13: Do you have an estimate of how much the Administration's proposed repeal of the fuel efficiency standards would increase petroleum demand?

Answer: This would be very difficult to estimate since the level of possible future standards is unknown. We believe the impact would be small since fuel efficiency levels are largely determined by the marketplace, with or without a standards program. For example, if miles traveled per vehicle remained approximately constant, we estimate that a decrease of 1.5 mpg in new cars would result in an increase of less than 40,000 barrels per day in the near-term and less in the long-term. In any event, the CAFE standards are expected to have inconsequential energy security benefits.

QUESTION FROM SENATOR METZENBAUM
QUESTIONS ON AUTOMOBILE FUEL DEMAND

Question 14: Considering that two-thirds of this Nation's petroleum consumption is in the transportation sector and that our dependence on foreign petroleum supplies is growing, it would appear that controlling this demand or developing alternative fuels should be a policy goal. Is the Administration pursuing either of these policy options?

Answer: The Administration believes the American people are best served if we rely on markets to determine the appropriate consumption level. In our view, there is no need to second guess the level of demand they select.

In addition, the Department of Energy supports an extensive R&D effort focused on increasing the efficiency of heat engines used in the transportation sector. This work ranges from ceramic materials research to fundamental studies of combustion in conventional engines to basic research in the development of alternative fuels. Successful development and application of the technologies from these programs could substantially reduce future transportation oil demand.

With regard to alternative fuels, DOE has initiated a detailed "Assessment of the Cost and Benefits of

Flexible and Alternative Fuel Use in the Transportation Sector." The results of this assessment will serve as a basis for developing policies to reduce oil dependency in the transportation sector. Many believe that any significant reduction in U.S. oil use will require large scale use of non-petroleum transportation fuels, we believe is best to let markets -- consumers and producers -- determine whether this in fact proves to be the case.

QUESTION FROM SENATOR METZENBAUM
QUESTIONS ON AUTOMOBILE FUEL DEMAND

Question 15: Do you have an estimate of how much the recent increase in the speed limit will increase petroleum demand?

Answer: Until we start to get measurements of the actual change in highway travel speeds, and a better idea of how many states will adopt the speed limit increase and on which highways, it is difficult to make a reliable estimate of the effect of changing the Federal 55 mph speed limit. Our best guess now is that the increase in demand will be less than 1 billion gallons per year, or less than 1% of highway fuel use.

QUESTION FROM SENATOR METZENBAUM
QUESTIONS ON AUTOMOBILE FUEL DEMAND

Question 16: What has this Administration done to decrease demand for petroleum products in the transportation sector?

Answer: The Department of Energy's efforts in the area of transportation energy use are focused largely on research and development programs to increase efficiency in the transportation sector. R&D includes high temperature ceramics for more efficient internal combustion engines, turbine engines that can use a variety of fuels, and battery and drive systems for electric vehicles.

The Department of Energy is now undertaking a comprehensive study of fuels other than petroleum for use in the transportation sector.

The Department also provides consumer information in the form of the Gas Mileage Guide to aid new car buyers in selecting fuel efficient vehicles.

QUESTION FROM SENATOR NICKLES

Question 17: Provide a list of countries that impose import fees and/or tariffs and amounts.

Answer: In general, crude oil imports are duty free with the following notable exceptions:

The United States imposes a customs duty on crude oil from non-Communist countries of 5.25 cents per barrel for crude oil with an API gravity below 25 degrees and 10.50 cents per barrel for crude oil with an API gravity of 25 degrees or more. The rates for crude oil imports are higher for Communist countries designated to not have Most Favored Nation status. In addition, all U.S. petroleum imports are subject to a Customs Service user fee, a port use tax, and a tax to finance both the Hazardous Substance Superfund and the Oil Spill Liability Fund.

Japan imposes a crude oil import duty of 530 yen per kiloliter. At the exchange rate on June 5, 1987, this amounted to an import duty of 59 cents per barrel.

Currently the European Communities (EC) have duty free crude oil imports. However, the EC has the capability to administratively impose a

6 percent ad valorem tax. The EC member countries are Denmark, Ireland, West Germany, France, Italy, Netherlands, Belgium, Luxembourg, United Kingdom, Greece, Spain, and Portugal.

QUESTION FROM SENATOR NICKLES

Question 18: Why did you use a 10 percent discount rate in your import fee analysis? CBO uses, for example, 6.7 percent for 1987-1992.

Answer: The oil import fee analysis uses the 10 percent discount rate mandated by the Office of Management and Budget for all Executive Branch benefit cost analysis dealing with multi-year periods. The uniformity requirement is described in Budget Circular A-94, issued in 1972.

QUESTION FROM SENATOR NICKLES

Question 19: What is the ripple effect for oil industry secondary jobs, such as tubular steel or drilling chemicals; you used 1 to 1.2, while many in industry and the producing States use much higher multipliers. Please tell us the basis for your 1.2 ratio, and the results of your survey of other ratios.

Answer: The employment effects reported in Energy Security are taken from two sources. The direct oil industry effects are derived from the GNP impacts and concensus measures of the number of jobs per million dollars of GNP impact. The EIA models used for the import fee analysis do not directly provide employment effects. Oil service industry employment impacts were calculated from industry data on the incremental labor demand from increased drilling activity. This calculation is also done "off-line." The 1.2 ratio cited is the sum of direct job gains from the oil and oil service industries.

While an increase in oil employment could shift employment balances among the states, and in favor of the oil-producing regions, the aggregate national impact of shifts in primary

employment on nationwide employment in secondary industries is neutral. Since the focus of the DOE study was on overall national economic impacts, and not the relative gains of one state against another, the study focused primarily on the aggregate national impacts. No multiplier on the direct job gains was used.

QUESTION FROM SENATOR NICKLES

Question 20: What production response do you predict for an $18 and $20 floor import fee? What caveats would you place on the accuracy of your estimate?

Answer: Estimates of the impact on oil and gas production from a "price floor" depend on the underlying assumptions of economic and other variables. Changes in these assumptions can significantly affect the estimates. In Energy Security, a $22/barrel price floor was analyzed under the lower price scenario and resulted in an estimated average increase in oil production of 440,000 barrels/day from 1988-1995. This analysis did not take account for inflation.

At current prices of nearly $20 per barrel, a price floor on domestic oil prices at $18 or $20 may have no measurable direct production effect. Since current prices exceed $18 and are close to $20 per barrel, it is possible that producers would not change any decisions with the hypothesized price floor.

However, even at prices above an enacted floor there could be an indirect effect on production levels. With the added security of a price floor, lenders might be more confident of

the repayment ability of oil industry borrowers, and be more willing to make oil industry loans. Because loan approval and investment are dependent on so many variables and considerable discretion, we are unable to estimate the specific production effect of a price floor at or below current prices.

QUESTION FROM SENATOR NICKLES

Question 21: Explain why the Administration uses "net imports" instead of "gross imports" to describe U.S. dependency on foreign oil. Where do we send our "exports"? What types of petroleum are exported and in what volumes? Would these exports stop if there were an international price hike or world shortage? Explain your answer.

Answer: We think that net oil imports provide a better measure of our import dependence than gross imports. Neither measure, by itself, provides an adequate measure of the Nation's vulnerability and supply disruption, however.

U.S. exports of crude oil and refined products comprise part of the destination countries' import dependence--not part of U.S. dependence. If all countries measure their import dependence in terms of gross imports, many oil flows would be counted more than once. For example, quantities of crude oil that are imported into the U.S. and subsequently refined and shipped as products to Japan would be counted toward the total import dependence of both the U.S. and Japan. (An exception to this principle could be shipments to the U.S. territories, which could be considered as a domestic transfer rather than an export.)

The following table shows the disposition of exports from the U.S. (50 states) in 1986.

U.S. Oil Exports by Destination
(Percent of Total Exports)

Destination	Crude Oil	Gasoline and Middle Distillates	Fuel Oil	Petroleum Coke	Other	Total
Canada	2	3	Negl.	2	3	10
Caribbean	14	2	5	Negl.	Negl.	21
Europe	Negl.	4	2	14	2	22
Mexico and Central America	Negl.	2	3	Negl.	3	8
Far East	Negl	6	9	8	Negl	23
Other	4	1	1	7	3	16
Total	20	18	19	31	12	100

Note: Column totals may not add due to rounding.

Most U.S. exports probably would not stop if an oil supply disruption or price hike occurred. In fact, stopping U.S. exports in an emergency would not increase our security. If the U.S. ceased exports to Japan, for example, the Japanese importers who had depended on the U.S. would go elsewhere for their supplies, thereby reducing the amount of supplies available to the U.S. and other importing countries. The net effect on U.S. supplies and on the world oil price would be the same, regardless of whether or not the U.S. stopped its oil exports. (The long-term effects on U.S. exporter's commercial interests could be damaged, however, if exports were stopped.)

QUESTIONS FROM SENATOR McCLURE

Question 22: Nowhere in the Department's Energy Security report do I find any substantive analysis of the petroleum refining capacity issue. Why not?

Answer: U.S. oil refining capacity is discussed on pages 61 and 62 of the Energy Security report. The report refers to a previous publication, entitled Product Imports, Energy Security and the Domestic Refining Industry, which was issued by DOE in June 1986. The earlier publication addressed the issue of oil refining capacity in more detail than the Energy Security report. The conclusions drawn from the earlier report were considered still to be valid and were summarized in the Energy Security report. Although the refining industry faces tough competition from abroad, it has successfully adapted to this situation through restructuring and through investments in new technologies. DOE's analysis shows that the industry should be able to cope successfully with tough market conditions into the 1990's. Total U.S. refining capacity and the expected level of refined product imports pose no energy security threat to the United States.

QUESTION FROM SENATOR McCLURE

Question 23: Subsection 310(d) of the fiscal year 1987 Budget Reconciliation Act requires the President to "report his views concerning the levels at which imports of crude oil and refined petroleum products become a threat to the national security."

a. Nowhere in the President's transmittal to Congress do I find any mention of the issue of the levels of imports which threaten the national security. Why not?

Answer: The President's letter to Congress identified the "serious implications for national security raised by" rising oil imports and the 1986 price decline, which harmed the oil producing industry. No specific level of imports at which imports threaten national security was identified because the level of imports alone is an insufficient indicator of energy security. Depending on other oil market factors, such as the level of excess production capacity worldwide, the level of strategic stocks, the degree of worldwide dependence on the Persian Gulf, and the existence of domestic allocation controls, the U.S. may be relatively secure at higher levels of imports or relatively insecure at lower levels of imports.

b. What are your views on the level of foreign oil imports which threaten the national security--40 percent?; 50 percent?; 60 percent?

Answer: In 1973, when gross imports into the U.S. represented less than 40 percent of consumption, the U.S. was subjected to a significant oil supply disruption, resulting in rapidly escalating oil prices which contributed to an economic recession. Thus, the U.S. can apparently be insecure at import levels of less than 40 percent . The economic effects of the outbreak of the Iran/Iraq war in 1980 were minimal, however, even though U.S. gross imports represented 40 percent of consumption at the time. Many of our allies were, in fact, 100 percent dependent on oil imports in 1980, yet they also were little affected by the disruption. Provided that the world has adequate excess production capacity, that strategic stocks are large and/or that the world's sources of supplies are adequately diversified, the U.S. can be relatively secure at import dependence levels of 40 percent or above.

c. In your opinion, at what point should we begin an all-out effort to promote domestic energy production in order to lessen imports?

Answer: The President has instructed the Secretary of Energy to provide him with periodic assessments of our energy security risks and has stated that it may be necessary to consider additional options for encouraging domestic exploration and production if our U.S. industry continues to be diminished and national security risks increase.

The Department of Energy is monitoring a wide-range of domestic and international energy indicators and will advise the President if trends in these indicators point to further declines in our domestic oil producing industry or increasing energy security risks. Certainly, if we appeared to be following the trends identified in DOE's lower price case projection, with the Persian Gulf share of free world production rising to 45 percent by 1995, we would be

examining the necessity for taking further action. It should be noted, that even under current trends, which are considerably more favorable than the lower price case, the Administration is supporting several actions which would significantly improve the state of our domestic oil and gas producing industry.

QUESTION FROM SENATOR McCLURE

Question 24: On page 73 of the Energy Security report, the Department states that:

> An import fee is essentially a "drain America first" program. A fee raises the U.S. crude oil price and encourages accelerated production of U.S. reserves, leaving smaller reserves here for future production and impairing long-term energy security (emphasis supplied)

I am very disturbed by this statement. The same logic could be applied to onshore and OCS leasing, development of the Arctic National Wildlife Refuge, and all other programs to allow or encourage domestic oil and gas development.

Do you stand by this assessment that promoting domestic production is a "drain America first" program?

Answer: The term "drain America first" has been used to refer to policies that accelerate production from known reserves, rather than adding to the stock of discovered reserves. Accelerating production of known reserves simply moves forward production that would occur anyway. Policies that encourage exploration in new areas, increase the volume of exploration expenditures, or speed the discovery of more efficient oil recovery techniques increase the ultimate recovery of oil.

For these reasons, some methods of increasing domestic oil production are more worthwhile than others, and some domestic incentive proposals are subject to the "drain America first" criticism. In our view, it makes sense to let markets work to determine the right combination of domestic production and imports to fuel the U.S. economy.

QUESTION FROM SENATOR McCLURE

Just prior to the 1973 Arab oil embargo, the United States was approximately one-third foreign oil dependent. Our dependency level is today just about the same, but the Department's Energy Security report indicates that it would double by 1995.

Question 25: In light of the projected increase in our foreign oil dependency, do you seriously believe that the legislative recommendations made by the President are adequate? What other steps could and should be taken?

Answer: The President's recommendations are adequate to meet current energy trends. Although from an energy security perspective, it could be argued that more should be done to support domestic oil producers, from the perspective of the President, these additional actions were not justifiable. The President must consider the effects of any actions on the federal budget, on the economy and on other important priorities, such as the recently reformed tax code. There are other steps which could be taken to encourage more domestic exploration and production, but these actions would, in general, result in higher federal outlays, increased costs to consumers, and/or difficult revisions to the tax code. Under current conditions, the Administration cannot justify these additional actions, but the Administration will consider taking additional actions if energy security risks increase or the domestic oil industry continues to be diminished.

The actions that have been proposed by the President are relatively low cost options. It is difficult to justify any higher cost options until we have first exhausted these lower cost alternatives. We, therefoe, would urge Congress to move quickly to adopt the options recommended by the President.

QUESTION FROM SENATOR HATFIELD

Question: 26: What are the Administration's plans to assist the domestic oil industry?

Answer: The Administration is committed to maintaining a strong and viable domestic oil and gas industry. Recently, the Administration proposed repealing the Windfall Profit Tax (WPT); comprehensive natural gas reform, including wellhead price decontrol, mandatory contract carriage and demand restraint repeal; approval of the Department of the Interior's five-year offshore oil and gas leasing plan; reducing the minimum bid requirements for Federal offshore leases; permitting environmentally sound energy exploration and development of the Arctic National Wildlife Refuge (ANWR); and making technical changes in the tax code related to the percentage depletion allowance -- repeal of the "Transfer Rule" and increasing the net-income limitation. Repealing the WPT would remove from the oil and gas industry an unfair tax which specifically targets oil industry profits, and thus, substantially reduces the incentive to invest in oil and gas exploration and development. Enacting the technical changes in the tax code would preserve an estimated 113,000 barrels per day of marginal oil and gas production. Opening ANWR to exploration and development could yield another 9 billion

barrels in recoverable oil reserves for the long term. Expanding offshore oil development would increase domestic oil and gas reserves substantially. The Administration is closely monitoring key indicators of industry activity from which it will be able to determine what, if any, other actions are appropriate.

QUESTION FROM SENATOR MARK O. HATFIELD

SOLAR ENERGY

Question 27: What has the Administration proposed to help the domestic solar industry?

Answer: It is our view that the key to realizing the promise of solar energy lies in research necessary to advance the economic viability of these technologies on a broad front to provide the private sector with a portfolio of energy supply options as the marketplace requires additional competitive electric, gaseous, and liquid energy supplies. We have, therefore, proposed budgets which focus on these critical advances while maintaining a programmatic breadth. A significant proportion of these funds are directed to industry contracts in order to support an emerging industrial capacity in this area. Further, we are and will continue to institutionally and financially support the activities of the Committee on Renewable Energy Commerce and Trade (CORECT) which serves as a vehicle to assist industry in offering currently available technology in important international markets where they are presently most competitive.

QUESTION FROM SENATOR HATFIELD

CONSERVATION RESEARCH

Question 28: What steps are being taken to see that conservation and fuel efficiency gains are maintained and improved?

Answer: The success of the energy efficiency improvements seen thus far came primarily from individual actions, rather than government mandated programs. Should prices rise, the record shows that energy users will adjust their energy use appropriately. This has taken place primarily through market forces, with energy consumers making their own fuel choices or investing in various methods of using energy more efficiently. For example, between 1972 and 1984--a period during which there were no federal appliance efficiency standards--the weighted average energy efficiency of new refrigerators increased approximately 71 percent, clothes washers 55 percent, and freezers 59 percent. The average fuel economy of all new automobiles purchased in the U.S. has consistently exceeded the Corporate Average Fuel Economy standard over the last several years, and current total residential energy use is almost the same as it was a decade ago, despite a 22 percent increase in the number of households.

Improvements in average energy efficiency can be expected to continue--despite the decline in world oil prices--through the eventual turnover of almost all less-efficient capital stock and replacement with new,

more energy efficient products and devices. The memory of high prices in the past will continue to influence additional investment by consumers toward efficiency, and the expectation of a return to higher prices at some future date will also be a factor. Market forces will continue to determine the appropriate conservation responses, but DOE R&D programs seek to support the availability of new technologies for possible commercialization by the private sector. Even in research and development, however, the great bulk of R&D expenditures relating to specific energy production, distribution, and use will still come--as they traditionally have--from private sector entrepreneurs competing with each other in order to make a profit.

Ultimately, success in energy efficiency will depend literally on actions by tens of millions of individuals and organizations, whose actions are inherently decentralized. Small actions by a multitude of people result in large cumulative effects.

QUESTION FROM SENATOR HATFIELD

Question 29: How dependent is the United States on Persian Gulf oil? How dependent are our allies -- both in Western Europe and Japan? Specifically, what percentage of our oil comes from the Gulf and how does that statistic compare to the situation in 1973?

Answer: In 1986, the U.S. imported 900 thousand barrels per day of oil from the Persian Gulf. This accounted for 6 percent of U.S. consumption. Western Europe imported 3.5 million barrels per day (29 percent of consumption) of oil from the Persian Gulf in 1986. For Japan, imports from the Persian Gulf were 2.6 million barrels per day or 59 percent of consumption. In 1973, the U.S. imported 1 million barrels per day of oil from the Persian Gulf, accounting for 6 percent of U.S. consumption at that time. It should be noted that any single country's level of dependence on the Persian Gulf is a poor indicator of that country's energy security; it is more important to focus on the percent of total world supplies that come from the Persian Gulf.

QUESTION FROM SENATOR HATFIELD

Question 30: Please explain the Department of Energy's position on maintaining the passage of oil tankers through the Strait of Hormuz.

Answer: It is understandable that several questions regarding the proposed reflagging of Kuwaiti vessels under the U.S. flag have come to the fore light of the recent attack by Iraqi aircraft on the USS Stark, with tragic loss of life. This Administration, like its predecessors, regards the Gulf as an area of major interest to the U.S. and its allies and is committed to maintaining the free flow of oil from this region. We view the continuation of that conflict as a threat to our interests and are working intensively to bring that war to an early end, with the territorial integrity and independence of both sides in tact.

Over the past few years, over 100 oil tankers have been attacked in the Persian Gulf, and in recent months, these attacks have been increasingly directed against non-belligerent countries. Since last summer, Kuwait has been a particular target of Iranian threats, with Iranian attacks on more than 30 vessels serving Kuwaiti ports since last September. Several months ago, Kuwait asked for our assistance, fearing potential damage to its economic lifeline.

In the context of these developments, Kuwait asked to register a number of its ships (11) in its tanker fleet under U.S. flag. We informed the Kuwaitis that if the ships met stringent ownership and other technical requirements under U.S. laws and regulations, they, like any other qualified applicant, could be registered under the U.S. flag. By virtue of the fact that these vessels would fly the American flag, they would receive U.S. Navy protection given any U.S. flag vessel transiting the Gulf. The U.S. Navy has always had the mission to provide appropriate protection for U.S. commercial shipping worldwide within the limits of available resources and consistent with international law.

The U.S. naval protection of these U.S. flag vessels was reaffirmed at the highest U.S. Government level, consistent with our long-standing commitment to the uninterrupted flow of oil through the Gulf and the importance we attach to the freedom of navigation in international waters, as well as our determination to assist our friends in the Gulf. Our response to Kuwait demonstrates our resolve to protect our interests and those of our friends in the region.

QUESTION FROM SENATOR HATFIELD

Question 31: I believe that the United States currently is importing less than 6 million barrels of oil per day. On page 94 of the Energy Security Report, you estimate that this country could save the equivalent of 5-12 million barrels of oil per day by the end of the next decade if "existing cost-effective technologies and those anticipated from future R&D are applied fully to improve energy efficiency." Would not a full commitment to develop these technologies make us independent of Persian Gulf oil by the year 2000?

ANSWER: The estimate on page 94 of 10 to 25 quads (or 5-12 million barrels of oil equivalent) of energy conservation savings by the year 2000 comes from an in-progress review of six "conservation potential" studies. These range from studies made in the late 1970s, to a more recent analysis by the National Audubon Society and a 1985 estimate by the DOE Office of Conservation and Renewable Energy.

The wide range in these estimates is due partly to different assumptions about "base cases", energy prices, and market acceptance of new technology, as well as differences in methodology. DOE's Office of Policy, Planning and Analysis has work underway to narrow this range by normalizing data and adjusting to a more common base case in order to account for other

differences such as economic growth. When this work is done we expect a narrower and more reliable range of future conservation potentials.

Many of the technologies referenced in the studies are already available in the marketplace. Other technologies are under development by DOE and others. We expect that much of this technology will be adopted as the marketplace responds to energy prices and the changing cost and availability of the technology.

In fact, adoption of this technology is already assumed in our energy demand forecasts. The EIA Annual Energy Outlook estimate of energy demand for the year 2000 is about 87 quads, which assumes continuing efficiency improvements from both stock turnover and increasing efficiency of new stock, such as cars and appliances. Twelve quads of energy savings are assumed from increasing efficiency due to new technology. Stock turnover adds another 8 quads to these savings from what would otherwise be the case if no decrease in energy use intensity took place (compared to 1985 levels).

However, even if all this technology were adopted it would not significantly change our dependence on Persian Gulf oil. The 10 to 25 quad estimate represents all forms of energy, not just oil. The Report's reference to equivalency in barrels of oil was presented only to aid the reader, not to imply this is all oil savings. In fact, given how oil is used in the economy, we would expect about one quarter of these savings to be oil. A significant reduction in oil use will require alternative fuels for the transportation sector, not just further efficiency improvements.

Also note that the U.S. cannot free itself of dependence on Persian Gulf oil by eliminating U.S. imports from that area. Our allies are dependent in the area and, and as a world power, we must take their interests into account.

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QUESTION FROM SENATOR WEICKER

Question 32: Mr. Martin, I am sure you are aware that the Senate Finance Committee has recently reported out S. 490, a trade reform bill. Within the bill are provisions requiring the President to forecast U.S. dependence upon foreign oil each year and, whenever it appears that dependence may exceed 50 percent of consumption, propose ways to reduce them. These proposals would take automatic effect in 90 days unless overturned by an act of Congress. I have serious doubts regarding these requirements. Does the Administration feel such provisions are necessary for the President to respond in maintaining energy stability in our country?

Answer: The Administration is opposed to the provision in S. 490 that would limit U.S. imports to 50 percent of consumption. We fear that this provision could actually limit the President's flexibility to respond appropriately to any future energy security threats. We also are concerned that the automatic nature of this provision would require actions, the costs of which might exceed any potential energy security benefits. We think that there are other factors in addition to the degree of import dependence which are equally important indicators of U.S. energy security, and we would be concerned about any bill which would require the President to take a specific action on the basis of an oil market forecast.

QUESTION FROM SENATOR WEICKER

Question 33: Mr. Martin, how does the Administration view the provisions in the House Budget Resolution requiring mandatory donations of imported oil into the Strategic Petroleum Reserve to facilitate energy security? I find the provisions a veiled attempt at implementing an oil import fee. Would you agree with this?

Answer: Yes, mandatory donations of imported oil for the SPR would raise the cost of imported oil for the quantity that importers were able to use for their own sales commitments. Any increase in an importer's cost would generally be passed along to his customers. Therefore, a mandatory set-aside would effectively constitute a fee on imported oil. The Department of Energy recently completed a comprehensive analysis of oil import fees and found that their economic costs substantially exceed their energy security benefits. For these reasons, the Administration strongly opposes oil import fee proposals. We believe that acquisition of large lots of oil for the SPR, rather than contribution of numerous small lots of varying grades, is the most efficient method of building the SPR inventory.

QUESTION FROM SENATOR WEICKER, JR.

Question 34: Would the Administration agree that an excise tax upon gasoline and diesel fuels would be a direct incentive to conserve and encourage increased fuel efficiency?

Answer: No, an excise tax on gasoline would not be an effective incentive to conserve motor fuel and increase fuel efficiency.

A gasoline tax will only reduce imports by a small amount. In general, gasoline demand is relatively insensitive to higher gasoline prices.

We estimate that a 10¢ per gallon tax would reduce oil consumption by 160-210 thousand barrels per day, and a 25¢ per gallon tax would reduce oil consumption by 290-490 thousand barrels per day.

QUESTION FROM SENATOR WEICKER

Question 35: Mr. Martin, how important are energy conservation programs in terms of promoting long term energy security?

Answer: They are very important. We believe that oil will be a critical fuel in the United States for the next decade and longer. Our transportation and industry continue to depend heavily on petroleum products. The most promising strategies for the nation are to continue to encourage the application of cost-effective energy-efficiency technologies, and to develop the potential for fuel flexibility in motor vehicles. Even so, the Federal Government's role in promoting energy efficiency is fundamentally indirect. Federal efforts in R&D and labeling of appliances and vehicles can help, but efficiency improvement requires millions of very specific small decisions that are largely beyond the reach of the Federal Government.

APPENDIX II

Additional Material Submitted for the Record by Senator Domenici

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THE ENERGY SECURITY REPORT:

A CRITIQUE OF THE DEPARTMENT OF ENERGY'S OIL IMPORT FEE ANALYSIS

(DOE/S-0057, March 1987)

Prepared by:

Republican Staff of the Senate Budget Committee
June 1987

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THE ENERGY SECURITY REPORT:

A CRITIQUE OF THE DEPARTMENT OF ENERGY'S OIL IMPORT FEE ANALYSIS

SUMMARY

In the report entitled, Energy Security, the Department of Energy's (DOE) analysis of an oil import fee is based on flawed economic analysis and unrealistic assumptions. Based on this inappropriate analysis, DOE is able to conclude that an oil import fee is a costly and unwise policy option. In the following sections, this critique takes issue with the analysis, assumptions, and conclusions contained in the report regarding an oil import fee.

In particular, the report's method of cost-benefit analysis is severely flawed. DOE's study concludes that an oil import fee is harmful to our national economic welfare. Correct use of cost-benefit analysis would show that the oil import fee would produce a $23.77 billion net benefit to U.S. citizens, principally because the after tax cost of oil imports is reduced in response to an oil import fee (see appendix I).

Second, the claims made in the report regarding the effects of an oil import fee on the federal budget deficit are at odds with not only the analysis of the Congressional Budget Office, the Federal Reserve and a host of the private sector forecasting models, but also with the analysis reported in their own study.

DOE asserts on page D-4 of the report that, "Enactment of an oil import fee would not reduce the federal deficit, and it might actually increase it." A recent simulation done by the staff of the Federal Reserve Board estimates that between 1987 and 1991 a $5 oil import fee would cumulatively reduce the deficit by $58.9 billion. A similar study by the Congressional Budget Office estimates that the same fee would reduce the deficit by $48.9 billion over the same period. Even DOE's own work estimates a $10 oil import fee would, "...reduce the deficit by $69 billion for the period 1988 to 1995." (See appendix II).

Finally, the assumptions used in DOE's analysis are intentionally biased against an oil import fee. Combined with questionable macroeconomic analyses, the analysis allows DOE to show large net costs to U.S. citizens resulting from an oil import fee.

Thus, using the quantitative analysis contained in the energy security report and simply correcting for methodological

errors, one must reverse the conclusions drawn in the text of that study on two key policy issues. An oil import fee would contribute to enhanced economic welfare and federal deficit reduction. Further, if more realistic assumptions are used, the benefits of import fee would be even greater.

In the pages that follow we will show that the Department of Energy (DOE) analysis is flawed by examining: 1) the DOE welfare analysis of the effects of an oil import fee; 2) the implications of an oil import fee for federal deficit reduction; 3) the assumptions used by DOE in generating their results; and 4) the macroeconomic estimates adopted.

I. WELFARE ANALYSIS

The report attempts to measure the costs and benefits to the United States of the introduction of an oil import fee. The calculations presented in the tables beginning on page D-24 of the Energy Security study consist of four parts:

1. Welfare losses.

2. Gains from reduced import costs.

3. Macroeconomic losses.

4. Security benefits.

In the remainder of this section we will examine each of these components of the calculations.

Welfare Losses

The imposition of an oil import fee would, according to the report's model, raise the price of oil, inclusive of tax, faced by domestic consumers while lowering the world price of oil. For instance, as shown in Table B1 of the report (the table is reproduced in appendix III), a $5 per barrel oil import fee would raise the price to consumers to $18.98 from $14.49 in 1988. At the same time the world oil price would decline by $0.51.

The U.S. economy would experience losses from two sources. First, consumers would lose benefits because they would pay more for oil. Second, domestic supply would expand in response to a rise in the domestic cost of foreign oil. Domestic oil resources would be produced despite the fact that the cost of production would exceed the cost of imported oil. These two sources of inefficiency constitute the welfare loss shown on line 7 of Table B1. This component of the analysis is consistent with sound economic practice and we agree that these costs should be included in the analysis of the impact of an import fee. Line 12 of Table B1 shows that the present value of these losses over the 8 years of the study would be equal to $2.91 billion in 1985 dollars.

Gains from Reduced Import Costs

A second component of the cost-benefit analysis consists of the gains to the United States from the lowering of world oil prices. An import fee in the United States will reduce U.S. demand for foreign oil and will tend to lower the quantity of oil demanded at any given price on the world market. While the price of oil and petroleum products will rise to U.S. consumers, it will rise by less than the $5 fee because the world price of oil declines.

The oil import fee revenue is, in a proper cost-benefit analysis, neither a benefit nor a cost for it is a payment from U.S. citizens to the U.S. Treasury which represents the citizens. But the effect of the fee on world oil prices does lower the after-tax cost of imports. Once again we find that there is no reason to quarrel with the report's finding. Line 11 of Table B1 shows that the present value of the savings in import costs resulting from a $5 oil import fee would total $22.49 billion in 1985 dollars -- a figure that is nearly 8 times as great as the welfare losses discussed above.

Macroeconomic Losses

The dominant component of the quantitative cost-benefit analysis of an oil import fee in the energy security report is the macroeconomic loss. The addition of this measure to the other three elements of the analysis is an unsound and inappropriate application of economic methods.

It is not the results of the simple macroeconomic simulation exercise shown in the report that is in question here. Rather, it is the practice of simply adding the Gross National Product (GNP) losses of macroeconomic analysis to the microeconomic gains and losses that is an incorrect use of economic method.

The measure of consumer welfare used quite appropriately in the report is the so-called consumer surplus. This measure defines the consumer welfare benefit as "the amount that one is willing to pay above and beyond what one has to pay". Analogously, the measure of producer surplus is defined as, " the amount received for the product supplied above and beyond the cost of production". Both of these measures are measures of net benefit.

On the other hand, the macroeconomic loss used in the report is an estimate of the amount by which GNP is reduced in response to the oil import fee. GNP measures the "market value of all currently produced goods and services during a particular time that are sold through the market but not resold."

GNP losses are not measuring the same thing as the two welfare measures. The producer and consumer surplus measure the net benefit while GNP only measures the gross value of the production.

This is not to say that the disruptive effects of an oil import fee on the aggregate level of economic activity do not influence the welfare results. They do, and the energy security report includes their influence.

The demand curve represents the economy-wide demand for oil and the economy-wide consumer benefits are measured by the consumer surplus. When GNP declines as a result of the oil import fee an appropriate analysis will incorporate the effects of the fee on consumer welfare. The demand curve will shift to the southwest reflecting the diminished demand for oil as GNP falls. That would reduce the size of the consumer surplus. This is the appropriate method of including the welfare effects of GNP loss in cost-benefit calculations and, to their credit, the Energy Security Report includes this effect because GNP is a determinant in their energy demand function.

However, to include the macroeconomic losses separately is both over counting and double counting. It is over counting because GNP effects should enter the welfare calculation not directly but through the demand for energy function. It is double counting because the GNP effects are already in the demand function.

Since the losses to consumer welfare are already included in the microeconomic welfare calculation, the appropriate remedy would be to remove the category of macroeconomic losses entirely. Line 13 of Table B1 should be removed from the analysis.

To the extent that they are also included in the measurement of the security benefits of an oil import fee (Line 14c of Table B1), they should be removed there as well.

Security Benefits

The inclusion of the benefits of an oil import fee resulting from the savings in the event of a supply disruption is a noteworthy and important addition to the study. As mentioned above, it is inappropriate to include the macroeconomic benefits in this section just as it is inappropriate to include the macroeconomic losses in the analysis of normal market conditions. Therefore, to calculate the benefits of the oil import fee one should count only the microeconomic benefits in the event of a supply disruption. DOE correctly shows the microeconomic benefits as the sum of the savings from lower disrupted oil prices and savings from lower import costs. They are shown as

the sum of Line 14, A and B in Table B1 and they total to $4.19 billion in 1985 dollars.

It must be noted that these savings are represented as the present value in 1987 of a disruption in 1995. The calculation of present value involves a reduction in dollar benefits occurring in the future to incorporate influence of the time value of money. This is an entirely appropriate method but it makes the cost-benefit analysis of a supply disruption very sensitive to the choice of the year of the disruption. The report introduces a supply disruption in 1995, the last year of the study. Therefore the benefits, when discounted back to 1987 are the smallest they can possibly be and still be included.

If the supply disruption were to occur in 1988, rather than in 1995, the benefits of the oil import fee in the event of supply disruption would nearly double from $4.19 billion to $8.16 billion. This example is chosen to illustrate the sensitivity of the results to DOE's assumptions on the timing of the disruption. This assumption and others are discussed later in this critique. In fairness to the authors of the DOE report, their inclusion of the security benefits in their analysis is a noteworthy addition to the policy analysis of the effects of an oil import fee.

Summary of the Welfare Analysis

If the inappropriate use of the macroeconomic losses is omitted, as it should be, the cost-benefit analysis of a $5 oil import fee becomes;

	(billions of 1985 dollars)
Welfare losses	- 2.91
Reduction in Import Costs	+22.49
Security Benefits	+4.19
Net Benefit of $5 oil import fee	+23.77

Thus, a correct use of cost benefit analysis would indicate that, on net, the introduction of $5 oil import fee will improve U.S. economic welfare. This stands in contradiction to the conclusion reached in the Energy Security Report.

II. DEFICIT REDUCTION

The report also states that,

"Enactment of an oil import fee would not reduce the federal deficit, and it might actually increase it."

That statement, on page D-4 of the report, stands in direct contradiction to the statement that begins on the next page, D-5, which asserts,

"Based on EIA analysis and DRI economic models of the U.S. economy, an oil import fee of $10 per barrel would raise direct federal revenues of $155 billion and reduce the deficit by $69 billion for the period 1988 to 1995."

The pages showing this contradiction are shown in appendix II of this critique.

While it is not possible for us to resolve this contradiction between conclusion and analysis within the report, we can perhaps shed some light on the likely impact of an oil import fee on the federal budget deficit by looking at the results of other studies addressing that question. In particular, the Federal Reserve Board and the Congressional Budget Office have each undertaken an analysis of the effects of the oil import fee on the budget deficit.

In early 1987, the staff of the Board of Governors of the Federal Reserve conducted a simulation of the effects of the imposition of a $5 oil import fee and found that the budget deficit would be reduced cumulatively by $58.9 billion between 1987 and 1991. Their analysis shows that the deficit reduction is somewhat lower than the full extent of the import fee revenue collected but that the deficit would be reduced significantly.

The Congressional Budget Office, in a 1986 report entitled, "The Budgetary and Economic Effects of Oil Taxes", concludes that a $5 per barrel oil import fee would reduce the budget deficit on net by $46.8 billion between 1987 and 1991, assuming an initial oil price of $18 per barrel.

These two studies, together with the analysis provided by the EIA and DRI models that is cited in the Energy Security Report, (reproduced in appendix II at the end of this report) suggest that an oil import fee would make a substantial contribution to federal deficit reduction.

III. ASSUMPTIONS

The assumptions used in any economic analysis will have a dramatic impact on the results. A close examination of DOE's assumptions used in the Energy Security report shows that they are biased against an import fee, allowing it to conclude that an import fee would harm the economy. By assuming low oil import levels, high fixed fees, a high discount rate, a disruption that does not occur for eight years, and a disruption that only lasts 180 days, DOE minimizes the benefits and maximizes the costs associated with an oil import fee. The following is not an exhaustive analysis of the DOE assumptions, but simply a discussion of some of the more questionable assumptions adopted.

Import Levels

As the level of U.S. oil imports rise, the costs of an oil supply disruption increase. In making U.S. oil import projections, DOE's estimates of oil imports are below other projections:

	1995 Net Petroleum Imports (millions of barrels per day)
DOE Energy Security Study (average)	8.9
Data Resources, Inc.	9.5
Chase Econometrics	10.2
National Petroleum Council (average)	9.7

DOE's record on U.S. oil production and import projections has been off the mark in recent years.

DOE drastically over-estimated domestic oil production in 1986. As late as November 1986, DOE estimated that domestic production would run 8.8 million barrels per day in 1986. The actual production rate was 132,000 barrels per day below this level. Comparing DOE's 1985 projections for domestic production in 1986 with actual levels, DOE over-estimated the domestic production rate by 292,000 barrels per day.

For import levels, their projections were off by even a greater amount. DOE projected that imports would run 4.38 million barrels per day in 1986. Actual import levels ran 5.29 million barrels per day, a 20 percent increase over DOE's projections.

Level of Import Fee

In the text of the report, DOE formulates most of its criticisms based on its analysis of a $10 per barrel fixed oil import fee. By using such a large fee, DOE shows large economic costs and dislocations.

None of the bills before the Congress would set a fee as large as $10 per barrel. Seven of the eight bills introduced in the 100th Congress imposing oil import fees would assess a variable import fee. Under a variable import fee, the fee would decline as oil prices rose. Only one bill would set a fixed oil import fee, and it only would establish a 35 cent per barrel import fee.

In addition, the DOE analysis assumes the fee is adjusted upwards for inflation. Once again, this allows DOE to show large economic losses by assuming a large and growing import fee. None of the bills before the Congress would index fees to inflation.

Discount Rates

DOE assumes a 10 percent discount rate, which is exorbitant when compared to current rates. An appropriate discount rate is the cost of borrowing to the federal government since these interest rates will show the value of a dollar five, ten, or thirty years into the future for the United States. A review of federal long-term interest rates shows a 7 percent discount rate is the appropriate rate for the analysis.

In the analysis, DOE properly discounts future costs and benefits to take into account the time value of money. By using such a large discount rate, however, DOE can minimize the benefits of an oil import fee that occur in the future. Combined with the assumption that a disruption does not occur for another eight years, this assumption allows DOE to drastically discount the benefits that result when a disruption occurs. With a 10 percent discount rate, for example, a dollar today is only worth 47 cents eight years from now.

The study was conducted during the winter of 1986-1987, a period when prevailing rates average about 7 percent, and not the 10 percent DOE used. This is about the same time the Congressional Budget Office (CBO), a non-partisan analytical agency of the U.S. Congress, develops its assumptions for the budget. CBO uses the following long-term Treasury borrowing rates for fiscal year 1987 in its analysis of the budget deficit:

30 year Treasury rate = 7.51%
10 year Treasury rate = 7.2%

5 year Treasury rate = 6.9%

If we adopt DOE's assumption that a disruption occurs in 1995, it is most appropriate to use the 7 year Treasury rate (the rate closest to the eight year time period assumed for when a disruption occurs). Below are Treasury monthly averages for 7 year bonds during the period the DOE energy security study was being developed:

October 1986 = 7.24 percent
November 1986 = 7.08 percent
December 1986 = 6.97 percent
January 1987 = 6.92 percent
February 1987 = 7.02 percent
March 1987 = 7.06 percent

In its assessment of a $5 per barrel import fee, DOE calculates the security benefit as $4.19 billion using a 10 percent discount rate. If a 7 percent discount rate were used, the benefit would be $5.23 billion, a 25 percent increase.

Timing of the Disruption

By assuming the disruption occurs in 1995, eight years into the future, DOE diminishes the size of the benefits that result from an oil import fee. Combined with the large discount rate, this assumption allows DOE to show minimal benefits from an import fee.

History suggests this assumption is overly optimistic. During the past fifteen years there were at least three separate oil supply disruptions: the Arab oil embargo in 1972, which lasted five months; the Iranian Revolution in 1978, in which Iran's oil production has never recovered; and, the Iran-Iraqi War in 1980, which is in its seventh year. These recent events have forced Iran and Iraq to reduce their production by almost 6 million barrels per day in 1986 as compared to their peak production levels in the late 1970s.

The recent events in the Persian Gulf suggest that the U.S. is subject at any time to a sustained oil shortage from the Middle East, a region that holds over one-half of the world's oil reserves.

Length of Disruption

DOE assumes a disruption only lasts 180 days. It turns out that the strategic petroleum reserve (SPRO) under the Administration's budget will hold 663 million barrels by 1995, enough oil to replace 3.7 million barrels per day of imports for

180 days. As a result, SPRO mitigates most of the damages that would occur from a six month oil supply disruption. If DOE assumed the disruption lasted longer, however, the damages to the economy would be much greater. As discussed above, recent history suggests that a disruption could last much longer than the six month period DOE assumed.

The value of SPRO also declines as our import reliance grows. If DOE's projections of domestic production, domestic consumption, and the level of oil imports are off the mark, the protection provided by SPRO is eroded.

DOE also states in the study that its estimates assume a "timely drawdown of the strategic petroleum reserve during a disruption." If the federal government ran into delays or other problems with the drawdown and allocation of SPRO oil, the costs of the disruption would be much larger than DOE has estimated.

IV MACROECONOMIC ESTIMATES

DOE's estimates of macroeconomic loss in the Energy Security report are quite large in their own right. In fact they are so large that one economist has stated wryly that,

> "... this surprisingly large macroeconomic impact suggests a symmetric result. ...it implies that even a permanent system of effective oil price controls would produce net benefits for the nation."1/

As we stated in the first section of this critique, we do not believe that adding the microeconomic and the macroeconomic estimates together produces anything meaningful. The implication contained in the study that permanently lowering prices through a price control system will enhance national welfare should not be taken seriously. Rather, it further illustrates the flaws of a study using unsound economic practices.

The size of the macroeconomic estimates themselves are also subject to question. DOE bases its assumptions of oil prices affect on GNP by using results developed by Dr. Michael Darby in 1976. Darby, a reputable economist, conducted his study using data from the period between 1956 and 1976. Are estimates constructed over that period likely to produce accurate predictions for the late 1980's and beyond? We think not for several reasons.

During the 1970s, oil prices rapidly increased to

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1 See, "The $200 Billion Surprise: Energy Security and the Oil Tariff", by William W. Hogan of the Energy and Environmental Policy Center, Kennedy School of Government, Harvard University.

unprecedented heights. From 1956 to 1973, oil prices in constant 1982 dollars experienced a slow and steady decline from $9.93 per barrel in 1956 to $7.86 per barrel in 1973, a 21 percent cumulative decline in price over that 17 year period. As a result of the 1973 oil embargo, oil prices (in constant dollars) jumped in one year by $4.96 per barrel, a 63 percent increase.

Automobiles, homes, and capital equipment that were in place when the first OPEC shock hit were not designed in anticipation of high energy costs. Therefore the disruptive costs of adjustment to the oil price change were unusually high. In addition, the expansion of activity in the oil producing regions of this country may have been muted in the short run because of bottlenecks and capacity constraints. One might expect that these structural factors would combine to produce a large negative GNP response to an increase in oil prices.

Since Darby's 1976 analysis the economy has gone through an enormous adjustment from oil prices. In constant dollars, oil prices nearly tripled between 1976 and 1981, hitting a peak of $33.80 per barrel. In 1986, oil prices collapsed. From 1985 to 1986, in constant dollars, oil prices dropped by almost 50 percent, falling to $11.07 per barrel, the lowest price for oil in constant dollars since the oil embargo in 1973.

The current structural environment is different for several reasons. First of all, a $5 per barrel oil import fee would not push the domestic price of oil into an unprecedented range. Therefore the economy would be responding to a rise in oil prices that was within the range of recent experience when decisions were made regarding durable goods and capital goods purchases. In 1973, the U.S. economy consumed 20.9 thousand Btu per dollar of GNP. By 1986, this ratio had declined to 13.2 thousand Btu per dollar of GNP. The capital stock that is currently in place is much more energy efficient and the disruptive effects would be much smaller.

Second, the oil import fee would stimulate economic activity in depressed regions and sectors with substantial excess capacity. DOE's own report illustrates the large excess capacity in the petroleum sector of our economy. On page 59 of its own report, DOE shows that the rotary rig is down by 51 percent, the seismic crew count is down by 52 percent, and oil and gas extraction employment is down by 26 percent. All of these are measures of the enormous excess capacity in the petroleum sector. Therefore, the stimulative effects in response to a price change experienced by the energy sector would likely have a much more significant impact on domestic oil production than would have been generated by a price rise of comparable magnitude in the early 1970s.

Finally, the simple model structure used in the report does

not explicitly take into account the influence of macroeconomic stabilization policies that would tend to offset the influence of a price change. While one could argue that the parameters borrowed from Dr. Darby's study embody this influence, it is clear that the monetary authorities and the fiscal authorities have changed. Among other influences, the change from fixed exchange rates to a flexible exchange rate system would seem to almost assure one that the policy reactions would differ significantly from what they were during the period studied by Dr. Darby.

APPENDIX I:

PROPER COST-BENEFIT ANALYSIS OF A $5 PER BARREL OIL IMPORT FEE

Explanation

In its cost-benefit analysis of oil import fee, DOE combines the results of a macroeconomic and microeconomic analysis to discredit an oil import fee. A proper cost-benefit analsis would only use only a microeconomic analysis to measure the effects on the country's economic welfare.

The attached computer results are based on DOE's computer models and assumptions to measure the costs and benefits associated with a $5 per barrel import fee. The only change we made from DOE's analysis is to drop the improper addition of macroeconomic results in the analysis. The results of our analysis show a $5 per barrel oil import fee will lead to a net $23.77 billion benefit to the U.S. economy (1985 dollars).

1 FILE:BASV555 (MORE DEPENDENTCASE VS $5 FEE CASE)
2 HIDEPD D0203871 IFGAMS;REV-$2IMACRO ;$1985 ;MINMA C
3 18 Feb 87

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	
6 World Oil Price1/	27.03	14.23	14.36	14.49	15	15.49	16.69	17.9	19.1	20.31	21.51	3.25430
7												0.98826
8 Production												0.97552
9 Crude Oil2/	8.97	8.67	8.05	7.65	7.29	6.9	6.58	6.17	5.96	5.59	5.24	
10 Alaska	1.83	1.86	1.79	1.67	1.6	1.58	1.51	1.39	1.39	1.27	1.14	
11 Lower 48	7.15	6.81	6.25	5.98	5.69	5.32	5.08	4.79	4.57	4.32	4.1	
12 Natural Gas Plant Liquids	1.61	1.62	1.62	1.72	1.69	1.68	1.68	1.69	1.68	1.6	1.67	
13 Other Domestic3/	0.06	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
14 Processing Gain4/	0.56	0.56	0.56	0.57	0.57	0.58	0.59	0.59	0.6	0.62	0.62	
15 Total Production	11.2	10.9	10.29	9.99	9.6	9.22	8.91	8.51	8.3	7.87	7.57	
16												
17 Imports (including SPR)												
18 Crude Oil5/	3.2	4.11	4.64	5.15	5.59	6.27	6.64	7.07	7.42	7.98	8.35	
19 Refined Products	1.87	1.88	2.02	1.95	1.99	2.02	2.12	2.19	2.32	2.8	2.6	
20 Total Imports	5.07	5.99	6.66	7.1	7.58	8.29	8.76	9.25	9.75	10.78	10.95	
21												
22 Exports												
23 Crude Oil	0.2	0.17	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	
24 Refined Products	0.58	0.59	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	
25 Total Exports	0.78	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
26												
27 Net Imports (including												
28 SPR)	4.29	5.23	5.9	6.35	6.83	7.53	8.01	8.5	9	10.03	10.19	
29												
30 Primary Stock Changes												
31 Net Withdrawals6/	0.22	-0.14	0.09	-0.04	-0.01	-0.05	-0.02	-0.02	-0.02	-0.03	-0.02	
32 SPR Fill Rate Additions (-)	-0.12	-0.05	-0.06	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	
33												
34 Total Primary Supply8/	15.6	15.94	16.22	16.27	16.38	16.67	16.86	16.95	17.24	17.83	17.72	
35												
36 Refined Petroleum Products												
37 Motor Gasoline	6.83	7.04	7.02	6.97	6.93	6.96	6.92	6.88	6.91	6.93	6.96	
38 Jet Fuel9/	1.22	1.3	1.33	1.39	1.41	1.46	1.47	1.48	1.49	1.49	1.5	
39 Distillate Fuel	2.87	2.88	3.01	3.05	3.1	3.15	3.22	3.27	3.33	3.39	3.42	
40 Residual Fuel	1.2	1.42	1.29	1.17	1.22	1.34	1.46	1.53	1.68	2.17	1.97	
41 Other Petroleum Products10/	3.61	3.46	3.67	3.7	3.72	3.76	3.79	3.8	3.83	3.85	3.87	
42 Total Product Supplied	15.73	16.1	16.33	16.27	16.38	16.67	16.86	16.95	17.24	17.83	17.72	
43												
44 Refined Petroleum Products												
45 Supplied to Sectors												
46 Residential and Commercial	1.35	1.35	1.4	1.43	1.45	1.46	1.47	1.46	1.46	1.45	1.43	
47 Industrial11/	4	3.96	4.14	4.17	4.21	4.27	4.32	4.33	4.37	4.41	4.43	
48 Transportation	9.88	10.12	10.27	10.31	10.34	10.45	10.48	10.49	10.6	10.69	10.78	
49 Electric Utilities	0.48	0.64	0.5	0.34	0.37	0.46	0.58	0.66	0.81	1.27	1.06	
50 Total Consumption	15.71	16.08	16.31	16.26	16.37	16.65	16.85	16.95	17.24	17.82	17.7	
51												
52 Discrepancy12/	-0.12	-0.14	-0.1	0.01	0.02	0.02	0.01	0.01	0	0.01	0.01	
53												
54 Net Disposition13/	15.59	15.94	16.22	16.27	16.38	16.67	16.86	16.95	17.24	17.83	17.72	
55												
56 Real GNP	3585	3686	3784	3906	3986	4105	4239	4351	4459	4572	4688	
57 NIPA GNP Price Deflator												

58	(1982:1.00).....	1.115	1.142	1.176	1.219	1.265	1.317	1.379	1.45	1.526	1.609	1.699
59												
60												

61 MIDPT1 D0203871 IFGAMS;$22/5TIMACRO ;$1985 ;MINMA C

62	18-Feb-87	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
63												
64												
65	World Oil Price1/.....	27.03	14.23	14.36	18.98	18.96	19.05	19.91	20.83	21.97	23.23	24.58
66												
67	Production											
68	Crude Oil2/.....	8.97	8.67	8.05	7.96	7.66	7.15	6.76	6.35	6.09	5.78	5.46
69	Alaska.....	1.83	0	0	0	0	0	0	0	0	0	0
70	Lower 48.....	7.15	8.67	8.05	7.96	7.66	7.15	6.76	6.35	6.09	5.78	5.46
71	Natural Gas Plant Liquids...	1.61	1.62	1.62	1.73	1.7	1.69	1.71	1.71	1.71	1.69	1.69
72	Other Domestic3/.....	0.06	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
73	Processing Gain4/.....	0.56	0.56	0.56	0.55	0.55	0.56	0.57	0.57	0.58	0.59	0.6
74	Total Production.....	11.2	10.9	10.29	10.29	9.96	9.46	9.09	8.68	8.43	8.11	7.8
75												
76	Imports (including SPR)											
77	Crude Oil5/.....	3.2	4.11	4.63	4.31	4.78	5.5	6.01	6.51	6.96	7.36	7.79
78	Refined Products.....	1.87	1.88	2.02	1.86	1.88	1.95	2	2.04	2.09	2.28	2.33
79	Total Imports.....	5.07	5.98	6.65	6.17	6.65	7.45	8.01	8.55	9.05	9.66	10.13
80												
81	Exports											
82	Crude Oil.....	0.2	0.17	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
83	Refined Products.....	0.58	0.59	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
84	Total Exports.....	0.78	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
85												
86	Net Imports (including											
87	SPR).....	4.29	5.23	5.9	5.42	5.9	6.7	7.26	7.8	8.3	8.91	9.37
88												
89	Primary Stock Changes											
90	Net Withdrawals6/.....	0.22	-0.14	0.09	0.06	-0.01	-0.04	-0.03	-0.03	-0.03	-0.02	-0.02
91	SPR Fill Rate Additions (-)	-0.12	-0.05	-0.06	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
92												
93	Total Primary Supply8/....	15.6	15.94	16.22	15.73	15.82	16.08	16.28	16.42	16.67	16.96	17.11
94												
95	Refined Petroleum Products											
96	Motor Gasoline.....	6.83	7.04	7.02	6.7	6.68	6.73	6.73	6.73	6.76	6.77	6.79
97	Jet Fuel9/.....	1.22	1.3	1.34	1.35	1.37	1.41	1.43	1.44	1.46	1.46	1.46
98	Distillate Fuel.....	2.87	2.88	3.01	2.97	3.02	3.07	3.13	3.17	3.24	3.29	3.33
99	Residual Fuel.....	1.2	1.42	1.29	1.08	1.1	1.19	1.27	1.34	1.44	1.64	1.71
100	Other Petroleum Products10/.	3.61	3.46	3.67	3.63	3.64	3.68	3.73	3.74	3.78	3.8	3.82
101	Total Product Supplied....	15.73	16.1	16.33	15.73	15.82	16.08	16.28	16.42	16.67	16.96	17.11
102												
103	Refined Petroleum Products											
104	Supplied to Sectors											
105	Residential and Commercial..	1.35	1.35	1.4	1.41	1.42	1.43	1.43	1.42	1.41	1.4	1.39
106	Industrial11/.....	4	3.96	4.14	4.01	4.05	4.12	4.18	4.21	4.26	4.3	4.33
107	Transportation.....	9.88	10.12	10.27	10	10.03	10.15	10.23	10.28	10.38	10.44	10.53
108	Electric Utilities.....	0.48	0.64	0.5	0.3	0.31	0.37	0.44	0.5	0.61	0.81	0.85
109	Total Consumption.....	15.71	16.08	16.31	15.72	15.8	16.07	16.27	16.41	16.66	16.95	17.1
110												
111	Discrepancy12/.....	-0.12	-0.14	-0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Net Disposition13/	15.59	15.94	16.22	15.73	15.82	16.08	16.28	16.42	16.67	16.96	17.11
Real GNP	3585	3686	3784	3895	3973	4092	4225	4337	4443	4554	4670
NIPA GNP Price Deflator (1982:1.00)	1.115	1.142	1.176	1.224	1.274	1.329	1.391	1.462	1.538	1.623	1.714
REFERENCE PRICE	5										
$5 FEE VS MORE DEPENDENT CASE											

18-Feb-87		1988	1989	1990	1991	1992	1993	1994	1995	
ASSUMPTIONS:										
DISRUPTION PROBABILITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
DISRUPTION PRICE		40.00	50.00	60.00	62.00	64.00	66.00	68.00	70.00	
CHANGE IN DISRUPTION PRICE									3.10	
BAU GNP ELASTICITY	-0.021									
DISRUPTED GNP ELASTICITY	-0.021					-				
MORE DEPENDENT BASE CASE VALUES:										
WORLD OIL PRICE (1985 DOLLARS)		14.49	15.00	15.49	16.69	17.90	19.10	20.31	21.51	
TOTAL PRODUCTION (MILLION BBL/DAY)		9.99	9.60	9.22	8.91	8.51	8.30	7.87	7.57	
TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY)		16.27	16.38	16.67	16.86	16.95	17.24	17.83	17.72	
NET IMPORTS (MILLION BBL/DAY)		6.35	6.83	7.53	8.01	8.50	9.00	10.03	10.19	
REAL GNP (BILLION 1982 DOLLARS)		3906	3986	4105	4239	4351	4459	4572	4688	
FEE CASE WORLD OIL PRICE		13.98	13.96	14.05	14.91	15.83	16.97	18.23	19.58	
FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS)		18.98	18.96	19.05	19.91	20.83	21.97	23.23	24.58	
FEE CASE MINUS BASE CASE:										
1. CHANGE IN RAC (1985 DOLLARS)		4.49	3.96	3.56	3.22	2.93	2.87	2.92	3.07	
2. CHANGE IN WOP (1985 DOLLARS)		-0.51	-1.04	-1.44	-1.78	-2.07	-2.13	-2.08	-1.93	
3. CHANGE IN PRODUCTION (MILLION BBL/DAY)		0.30	0.36	0.24	0.18	0.17	0.13	0.24	0.23	1.85
4. CHANGE IN CONSUMPTION (MILLION BBL/DAY)		-0.54	-0.56	-0.59	-0.58	-0.53	-0.57	-0.87	-0.61	
5. CHANGE IN IMPORTS (MILLION BBL/DAY)		-0.93	-0.93	-0.83	-0.75	-0.70	-0.70	-1.12	-0.82	
6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS)		-1.01	-2.24	-3.52	-4.72	-5.89	-6.45	-6.76	-6.60	
7. WELFARE LOSS (BILLION 1985 DOLLARS)		-0.76	-0.67	-0.54	-0.44	-0.37	-0.37	-0.60	-0.46	
8. MACRO LOSS (BILLION 1985 DOLLARS)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. SECURITY BENEFIT(BILLION 1985 DOLLARS)										
A. SAVINGS FROM LOWER DISRUPTED OIL PRICES		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	
B. SAVINGS FROM LOWER IMPORTS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.16	
C. MACROECONOMIC BENEFITS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS)		9.89	10.77	12.23	13.25	14.24	15.15	16.26	17.10	
PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 10%)										
11. REDUCTION IN IMPORT COST	22.49									
12. WELFARE LOSS	-2.91									
13. MACRO LOSS	0.00									
14. SECURITY BENEFIT(BILLION 1985 DOLLARS)										
A. SAVINGS FROM LOWER DISRUPTED OIL PRICES	0.85									
B. SAVINGS FROM LOWER IMPORTS	3.34									
C. MACROECONOMIC BENEFITS	0.00									

166 15. GROSS REVENUE FROM FEE	60.84
RESULT (cost/benefit of option) =	23.77

APPENDIX II:

CONTRADICTIONS OF DOE'S DEFICIT ESTIMATES

Explanation

The attached pages are from Appendix D: Overview and Analysis of Oil Import Fees of the DOE Report, Energy Security. These pages show a direct contradiction by DOE on the impact of an oil import fee on the federal deficit. On page D-4, DOE states, "Enactment of an oil import fee would not reduce the federal deficit, and it might actually increase it." One page later, DOE contradicts itself stating, "Based on EIA analysis and DRI economic models of the U.S. economy, an oil import fee of $10 per barrel would raise direct federal revenues of $155 billion and reduce the deficit by $69 billion for the period 1988 to 1995."

world reliance on oil from unstable regions continued to grow, a U.S. oil import fee could leave the potential for price shocks in a disruption little changed, despite lower U.S. imports.

Increased Oil Industry Employment

The higher domestic prices that followed enactment of an oil import fee would stimulate oil industry employment. Higher oil prices would spur the demand for geologists, seismic crews, drillers, tool pushers and oil service crews for logging and workovers—increasing employment generally in the oil industry. In addition, demand for pipe and other equipment would increase employment by tool and pipe manufacturers and in related sales companies.

A $10 oil import fee could raise oil field employment by about 100,000 jobs, and employment in equipment manufacturing by an additional 20,000 jobs. (Although the import fee would increase employment in the oil industry, this gain is not the only employment effect, as explained above and below.)

Import Fee Receipts

An import fee would produce expanded government receipts from fee collections at relatively little additional administrative cost. A fee of $5 per barrel would produce receipts of $10 - $17 billion per year, and a fee of $10 per barrel would bring $17 - $32 billion per year at the estimated import volumes occurring through 1995 (assuming no exemptions).

However, the economic impact of an oil import fee would reduce federal tax receipts from other sources significantly—notably from income and payroll taxes. In addition, federal expenditures could rise because of the effects of higher energy prices on federal purchases and transfer programs (such as Social Security) that are indexed to inflation. Enactment of an oil import fee would not reduce the federal deficit, and it might actually increase it. This is just one of a number of economic costs that should be examined in considering this policy option.

ECONOMIC COSTS OF OIL IMPORT FEES

Increased Energy Costs for U.S. Consumers and a Permanent Inflationary Increase in the U.S. Price Level

An import fee translates directly into higher prices for petroleum. As energy markets respond to higher oil prices, prices for other fuels will increase. The prices of natural gas and other fuels increase if an oil import fee is enacted. A fee of $5 per barrel would raise the prices of gasoline, heating oil, and other petroleum products by 8 to 10 cents per gallon. The consumer price index would rise by between 1 and 2 percent. An import fee of $10 per barrel would raise product prices by 16 cents per gallon and would raise the CPI by 2 to 3 percent.

For each $1 per barrel of fee imposed, oil consumers would pay more than $4 billion per year extra for their purchases of energy. As already indicated, the cost of gasoline, diesel fuel, jet fuel and heating oil would all rise by nearly the full increase in crude oil prices. The price of natural gas would also rise somewhat, as consumers sought to substitute natural gas for oil that had become more expensive after imposition of the import fee.

The higher energy prices paid by U.S. consumers would constitute income to the industry. Some of these funds would be spent for new investment to find additional oil, some would go to workers for wages, some to land owners as higher royalties, and some to oil companies as increased profits. A $10 import fee would transfer $30 billion annually from consumers to oil producers, and an additional $10 billion annually would go to the federal government.

A fixed import fee would increase oil prices from any given level, regardless of the financial needs of the domestic oil industry. A variable fee has the possible advantage of raising oil prices only when the price is lower than the legislated price that serves as a price floor.

Reduced U.S. Economic Activity

Higher oil prices in the U.S. reduce GNP by:

- reducing real consumer incomes and domestic consumption spending,
- reducing the international competitiveness of goods produced in the U.S. with high-cost energy,
- reducing investment in the U.S. economy.

An import fee would reduce the standard of living of U.S. consumers by raising energy prices and by using resources to produce oil at costs higher than the prevailing prices on the world market. As a result, fewer U.S. resources would be available to produce other goods for domestic consumption or for export in exchange for still other goods.

Annual GNP losses following enactment of an oil import fee would range from $15 to $25 billion for a $5 per barrel fee and from $30 to 45 billion for a $10 fee. The reasons for these losses include the reduction in resources available for use in industries other than oil, the higher cost of oil to businesses and households, and the reduced competitiveness of the U.S. economy at home and in export markets where American goods would compete with products manufactured and shipped with energy purchased at prices that did not include import fees. Even if a U.S. import fee caused world oil prices to fall, U.S. energy buyers would still pay more than buyers elsewhere, effectively by the full amount of any fee imposed.

Reduced Efficiency in Investment

An import fee would reduce GNP because it diverts real resources from more profitable uses into oil production and induces consumers to incur added costs to reduce their use of energy. Labor and capital would be used to produce oil at prices equal to the new domestic oil price, even though oil could be purchased more cheaply from foreign sources. Expenditures on conservation would also be made as if the saving from reduced oil use were the domestic price, rather than the actual free-market cost of oil in world markets.

Lower Total Employment Nationwide

Higher domestic oil prices following an oil import fee would boost employment in the oil industry, but overall employment would decline.

Employment in the oil industry and related sectors could increase by 120,000 jobs. However, reduced GNP due to higher oil prices and less efficient investment could reduce nationwide employment by 400,000 jobs. On balance, an oil import fee and the resulting increases in energy prices would reduce U.S. employment.

Impact on the Federal Deficit

An oil import fee would raise substantial direct revenues based on anticipated import volumes through 1995. However, the impact of an oil import fee on the economy (through higher energy costs) reduces other federal revenues. Based on EIA analysis and DRI economic models of the U.S. economy, an oil import fee of $10 per barrel would raise direct federal revenues of $155

billion and reduce the deficit by $69 billion for the period 1988 to 1995. An import fee does not reduce the deficit by the full amount of fees collected, however, because—as mentioned earlier—the resulting energy price increases reduce other tax collections and increase federal expenditures indexed to prices.

The Problem of Requests for Fee Exemptions to Protect Some Oil Exporters, Consumers and Others from Import Fee Consequences

Imposition of an import fee would tend to lower world oil prices and reduce the incomes of friendly oil exporting nations.

Other nations are likely to argue that a U.S. oil import fee would violate the General Agreement on Tariffs and Trade (GATT). A defense to this argument might note the national security exception provisions of the GATT. Nevertheless, the imposition of new fees by the U.S. could lead to retaliatory fees on U.S. goods. More importantly, Canada, Venezuela and Mexico would be likely to demand exemptions. The U.K. and Norway, strong U.S. allies and partners in the International Energy Agency, would almost surely also demand exemptions from the fee. If fee exemptions were granted, this would encourage "exempt" suppliers to concentrate on sales to the U.S. market—unless complicated country-of-origin quotas were established. Depending on the supply capacity of exempt foreign suppliers, exemptions could sharply reduce or even eliminate both import fee income and price benefits to the domestic oil industry.

Consumers may also urge fee exemptions for certain products, such as heating fuel, to limit the impact of price increases. Small refiners might demand higher tariffs on product imports to protect them against competition from foreign refiners. U.S. manufacturers whose exported products incorporate energy, either imported or domestic, might also demand fee rebates to permit them to compete successfully in foreign markets against foreign producers who do not pay U.S. energy costs. Once begun, there is no clear end to exemptions for an import fee.

Any exemptions or special provisions could raise administrative costs and revive the bureaucratic apparatus of the 1970's. The cost of government administration of price controls and entitlements in the 1970's is well documented, as are their costly, unintended consequences.

COMPARISON OF BENEFITS AND COSTS FROM AN OIL IMPORT FEE

Evaluation of an import fee should consider all the economic costs and consequences of raising U.S. energy prices; it is not sufficient to look only at the benefits to one region or economic sector in isolation. Under the assumptions of the Lower Oil Price Case used in this study, an oil import fee of $10 per barrel could reduce world oil prices by about $3 per barrel under normal market conditions, and about $6 per barrel below prices that would otherwise occur in disrupted markets. The $10 fee would also raise prices in the U.S. market by about $7 per barrel. U.S. oil import costs would decline by about $40 billion (1987 present value) through 1995 as a result of lower world oil prices and reduced U.S. import demand. Of course, these benefits would be realized only if world oil prices were actually allowed to decline following enactment of an import fee.

Energy security benefits consist of lower oil import costs, plus reduced economic losses from any disruption that might occur as a result of lower U.S. energy consumption levels. The "energy security benefit" of a $10 oil import fee is less than $6 billion in potential reductions of import payments and $2 billion in reduced GNP losses, even if a very large disruption is assumed to occur sometime during the next 8 years. Under a variety of alternate assumptions, total import fee benefits range from $50 to $70 billion, compared to a range of estimated costs from $190 to $250 billion over 8 years. Thus, the net loss to the economy from enacting an oil import fee is between $150 and $200 billion over the 8 years ending in 1995.

APPENDIX III:

TABLE B-1 FROM THE ENERGY SECURITY STUDY

Table B1: $5 FEE VS LOWER PRICE CASE

	1987	1988	1989	1990	1991	1992	1993	1994	1995
ASSUMPTIONS:									
DISRUPTION PROBABILITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
DISRUPTION PRICE		40.00	50.00	60.00	62.00	64.00	66.00	68.00	70.00
CHANGE IN DISRUPTION PRICE									3.10
BAU GNP ELASTICITY	-0.021								
DISRUPTED GNP ELASTICITY	-0.021								
LOWER PRICE BASE CASE VALUES:									
WORLD OIL PRICE (1985 DOLLARS)		14.49	15.00	15.49	16.69	17.90	19.10	20.31	21.51
TOTAL PRODUCTION (MILLION BBL/DAY)		9.99	9.60	9.22	8.91	8.51	8.30	7.87	7.57
TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY)		16.27	16.38	16.67	16.86	16.95	17.24	17.83	17.72
NET IMPORTS (MILLION BBL/DAY)		6.35	6.83	7.53	8.01	8.50	9.00	10.03	10.19
REAL GNP (BILLION 1982 DOLLARS)		3906	3986	4105	4239	4351	4459	4572	4688
FEE CASE WORLD OIL PRICE		13.98	13.96	14.05	14.91	15.83	16.97	18.23	19.58
FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS)		18.98	18.96	19.05	19.91	20.83	21.97	23.23	24.58
FEE CASE MINUS BASE CASE:									
1. CHANGE IN RAC (1985 DOLLARS)		4.49	3.96	3.56	3.22	2.93	2.87	2.92	3.07
2. CHANGE IN WOP (1985 DOLLARS)		-0.51	-1.04	-1.44	-1.78	-2.07	-2.13	-2.08	-1.93
3. CHANGE IN PRODUCTION (MILLION BBL/DAY)		0.30	0.36	0.24	0.18	0.17	0.13	0.24	0.23
4. CHANGE IN CONSUMPTION (MILLION BBL/DAY)		-0.54	-0.56	-0.59	-0.58	-0.53	-0.57	-0.87	-0.61
5. CHANGE IN IMPORTS (MILLION BBL/DAY)		-0.93	-0.93	-0.83	-0.75	-0.70	-0.70	-1.12	-0.82
6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS)		-1.01	-2.24	-3.52	-4.72	-5.89	-6.45	-6.76	-6.60
7. WELFARE LOSS (BILLION 1985 DOLLARS)		-0.76	-0.67	-0.54	-0.44	-0.37	-0.37	-0.60	-0.46
8. MACRO LOSS (BILLION 1985 DOLLARS)		-24.62	-21.81	-19.84	-17.48	-15.42	-14.59	-14.36	-14.62
9. SECURITY BENEFIT(BILLION 1985 DOLLARS)									
A. SAVINGS FROM LOWER DISRUPTED OIL PRICES		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83
B. SAVINGS FROM LOWER IMPORTS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.16
C. MACROECONOMIC BENEFITS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.97
10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS)		9.89	10.77	12.23	13.25	14.24	15.15	16.26	17.10
PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 10%)									
11. REDUCTION IN IMPORT COST	22.49	0.917212	1.850942	2.64577	3.221653	3.659269	3.642457	3.471244	3.079274
12. WELFARE LOSS	-2.91	-0.69279	-0.55546	-0.40515	-0.30103	-0.23242	-0.20696	-0.30628	-0.21433
13. MACRO LOSS	-99.25	-22.3795	-18.0267	-14.907	-11.9375	-9.57435	-8.23821	-7.36913	-6.8224
14. SECURITY BENEFIT(BILLION 1985 DOLLARS)									
A. SAVINGS FROM LOWER DISRUPTED OIL PRICES	0.85	0	0	0	0	0	0	0	0.85369
B. SAVINGS FROM LOWER IMPORTS	3.34	0	0	0	0	0	0	0	3.338851
C. MACROECONOMIC BENEFITS	2.32	0	0	0	0	0	0	0	2.320648
15. GROSS REVENUE FROM FEE	69.84	8.992273	8.89876	9.186702	9.049587	8.838815	8.550369	8.344336	7.977393